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Distribution extension for *Podarcis siculus* (RAFINESQUE-SCHMALTZ, 1810) (Squamata: Lacertidae), from Turkey

PEDRAM TÜRKOĞLU

Abstract

The Italian wall lizard (*Podarcis siculus*) originated throughout Italian mainland and later introduced to some other countries including Turkey. New localities were recorded from Bolu province and from Balıkesir province as southernmost records for *Podarcis siculus* known to date in Turkey. The specimen in Bolu province was photographed directly by the author, while the other specimen's observation in Balıkesir was taken from the iNaturalist database. These two new records significantly extend the distribution area of the species in Turkey southwards. It is presumed that the Filyos River surroundings are suitable for the distribution of the species. The distribution of *Podarcis siculus* is significantly wider than currently known.

Zusammenfassung

Die ursprünglich Italien bewohnende Ruineneidechse (*Podarcis siculus*) wurde in der Vergangenheit in einigen anderen Ländern, einschließlich der Türkei, eingeführt. Neue Lokalitäten wurden hier aus der Provinz Bolu sowie aus der Provinz Balıkesir als südlichste Funde für die Art in der Türkei erfasst. Das Exemplar in der Provinz Bolu wurde direkt vom Autor fotografiert, während die Beobachtung des anderen Exemplars in Balıkesir der iNaturalist-Datenbank entnommen wurde. Diese beiden neuen Nachweise erweiterten das bekannte Verbreitungsgebiet der Art in der Türkei erheblich nach Süden. Es wird vermutet, dass die Umgebung des Filyos-Flusses für die Verbreitung der Ruineneidechse geeignet ist. Wie erwartet, ist die Verbreitung von *Podarcis siculus* wesentlich größer als bisher bekannt.

Key words: *Podarcis siculus*, distribution range, lizard, range expansion

Introduction

The genus *Podarcis* (WAGLER, 1830) which belongs to Lacertidae family comprises 27 currently recognized species.

Podarcis siculus dorsal color varies from green to brown. Highly variable in pattern, including insular populations consisting of black individuals with blue ventral sides. Mainland species has reticulated green patterns on dorsal side. In males, at most half of the outer ventral scales are blue. Underside usually unspotted whitish or greenish. TL: 26 cm; SVL: 9 cm; significant size variation between populations, especially on islands (SPEYBROECK et al. 2016).

Podarcis siculus distribution originated throughout Italian mainland and ranges through surrounding islands including Sicily, Sardinia, Corsica, and East Adriatic coast from Italy to Croatia, also on countless islands and islets. However, it has spread to many countries (including the USA) via anthropogenic pathways. *Podarcis siculus* occupies a wide range of sunny habitats, from sea level to medium altitude, also com-

mon near human habitation. Its natural habitats are rocky areas, rocky shores, sandy shores, plantations, and urban areas. Usually from sea level to 1,000 m, but in Etna, Sicily found up to 2,200 m (SPEYBROECK et al., 2016).

The current distribution of *Podarcis siculus* in Turkey includes the Thrace region, Marmara region, and the west-central Black Sea coast (BIRD 1936; PODNAR et al. 2005; TOK et al. 2015). If we examine provinces and regions in detail, Marmara Sea, İstanbul (the European and Asian sides) (BIRD 1936; BODENHEIMER 1944; BAŞOĞLU & BARAN 1977; ÇEVİK 1999; JABLONSKI & STLOUKAL 2012), Bursa (UĞURTAŞ et al. 2000; MOLLOV 2009), Mt. Ida (HÜRMI et al. 2008), Zonguldak (ILGAZ et al. 2013), and Gelibolu (TOK et al. 2014). In addition, like pointed out before, *Podarcis siculus* may have been brought in the Marmara region accidentally by people or trade ships (BAŞOĞLU & BARAN 1977, UĞURTAŞ et al. 2000). Since it is a highly adaptable species, the aim of this study is to clarify the distribution of *Podarcis siculus* in Turkey and to show that the species range is expanding.



Fig. 1 – General view of sunbathing male *Podarcis siculus* from Yeniçağa, Bolu (Photo: PEDRAM TÜRKÖĞLU). Represented by the blue in the Figure 4. First known record in the Bolu province (as shown 77th data in Table 1).

Materials and Methods

Besides direct observation, I reviewed the literature and citizen science based open source database named iNaturalist for any possible records of the *Podarcis siculus* in Turkey. All known records listed on Google Maps. Two new records were obtained, one directly photographed and the other detected on the iNaturalist database.

Figure 1 is recorded with Nikon D5300 DLSR camera body and Tamron 150-600 mm G1 telephoto lens. Photographed from a distance approximately 4 meters away on the rocks below the bridge next to wetland (Figure 2). Altitude ~1000 m. Observation's coordinates are 40°48'23.5"N, 32°01'59.0"E.

Eskiçağa, Yeniçağa, Bolu province, western Black Sea region. 11:49 AM GMT +03:00. July 11, 2020.

Figure 3's data collected from open-source citizen science database iNaturalist. Observation's coordinates are 39°39'08.3"N, 27°53'53.9"E. Merkez, Karesi, Balıkesir province, southern Marmara region. 2:15 PM GMT +03:00. July 9, 2021.

Figure 4 is prepared with Google Maps. Marks shown in red represents published papers. Marks shown in green represents records on iNaturalist, which is the citizen science database. Among the records, data numbered 76 was entitled to be the southernmost record of the species in Turkey. Lastly, the mark shown in blue is the new locality record directly photographed.



Fig. 2 – A general view of the wetland next to the recorded location from Yeniçağa, Bolu (Photo: PEDRAM TÜRKÖĞLU).



Fig. 3 – General view of a male *Podarcis siculus* from Karesi, Balıkesir. (Photo: NİMET SAVAŞIR). Southernmost record known to date in Turkey (as shown 76th data in Table 1).

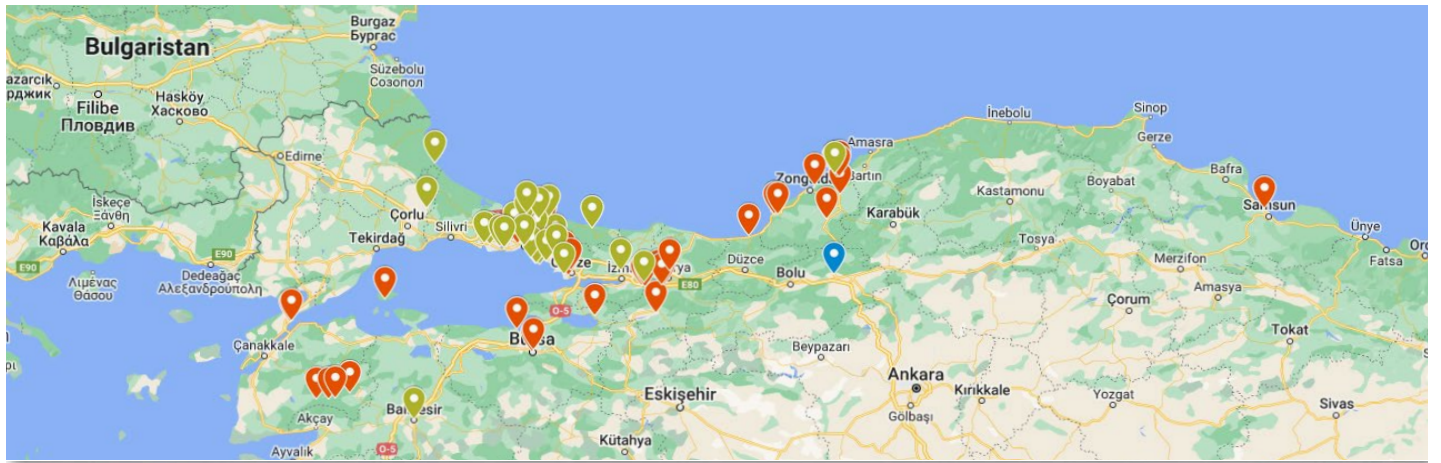


Fig. 4 – Prepared via Google Maps, represents academic references (red marks), iNaturalist observations (green marks) and directly photographed (blue mark), details showed in Table 1.

<https://www.google.com/maps/d/edit?hl=tr&mid=1beix8wN9As92a70tEu7-gXmxnor-kpU&ll=40.965462579047156%2C29.792304306911596&z=7>

Table 1. Biogeographic data of *Podarcis siculus* distribution in Turkey.

Location	Coordinates	Record Year	Reference
1. Gelibolu, Çanakkale	40.40819, 26.66347	2015	TOK et al. (2015)
2. Hamdibey, Çanakkale	39.85777, 27.25236	2008	HÜR et al. (2008)
3. İznik, Bursa	40.46919, 29.66919	2000	UĞURTAŞ & YILDIRIMHAN (2000)
4. Mudanya, Bursa	40.36466, 28.90819	2009	MOLLOV (2009)
5. Fatih, İstanbul	41.0188, 28.96444	1944	BODENHEIMER (1944)
6. Beykoz, İstanbul	41.14558, 29.1783	1936	BIRD (1936)
7. Marmara Adaları, Balıkesir	40.59036, 27.60261	1944	BODENHEIMER (1944)
8. Darıca, Kocaeli	40.78877, 29.38277	2019	KURNAZ et al. (2019)
9. Kartepe, Kocaeli	40.70255, 30.14413	2019	KURNAZ et al. (2019)
10. Serdivan, Sakarya	40.73844, 30.29736	2019	KURNAZ et al. (2019)
11. Geyve, Sakarya	40.49386, 30.28166	2019	KURNAZ et al. (2019)
12. Akçakoca, Düzce	41.09486, 31.19275	2019	KURNAZ et al. (2019)
13. Filyos, Zonguldak	41.56219, 32.02263	2013	ILGAZ et al. (2013)
14. Ereğli, Zonguldak	41.2703, 31.44955	2019	KURNAZ et al. (2019)
15. Çaycuma, Zonguldak	41.43019, 32.08805	2019	KURNAZ et al. (2019)
16. Devrek, Zonguldak	41.22744, 31.96077	2019	KURNAZ et al. (2019)
17. Atakum, Samsun	41.33247, 36.28611	2015	TOK et al. (2015)
18. Maltepe, İstanbul	40.96749, 29.14689	1944	BODENHEIMER (1944)
19. Osmangazi, Bursa	40.18923, 29.06135	2000	UĞURTAŞ & YILDIRIMHAN (2000)
20. Bayramiç, Çanakkale	39.80528, 26.93001	2014	TOK & ÇİÇEK (2014)
21. Yenice, Çanakkale	39.80706, 27.04332	2014	TOK & ÇİÇEK (2014)
22. Yenice, Çanakkale	39.81465, 27.11286	2014	TOK & ÇİÇEK (2014)
23. Kadıköy, İstanbul	40.9774, 29.04321	2012	JABLONSKI & STLOUKAL (2012)
24. Arifiye, Sakarya	40.7137, 30.35408	2019	KURNAZ et al. (2019)
25. Kartepe, Kocaeli	40.703750 30.139117	2019	KURNAZ et al. (2019)
26. Sapanca, Sakarya	40.69736, 30.16591	2019	KURNAZ et al. (2019)

Location	Coordinates	Record Year	Reference
27. Arifiye, Sakarya	40.71301, 30.33401	2019	KURNAZ et al. (2019)
28. Çaycuma, Zonguldak	41.41881, 32.09214	2019	KURNAZ et al. (2019)
29. Gelibolu, Çanakkale	40.41618, 26.6779	2019	KURNAZ et al. (2019)
30. Kilimli, Zonguldak	41.48133, 31.83696	2019	KURNAZ et al. (2019)
31. Çaycuma, Zonguldak	41.57026, 32.03726	2019	KURNAZ et al. (2019)
32. Çaycuma, Zonguldak	41.58117, 32.08139	2019	KURNAZ et al. (2019)
33. Çaycuma, Zonguldak	41.55319, 32.06003	2019	KURNAZ et al. (2019)
34. Ereğli, Zonguldak	41.26111, 31.44088	2019	KURNAZ et al. (2019)
35. Ereğli, Zonguldak	41.26173, 31.48046	2019	KURNAZ et al. (2019)
36. Çaycuma, Zonguldak	41.5489, 32.0772	2019	KURNAZ et al. (2019)
37. Zeytinburnu, İstanbul	41.02406, 28.90175	2019	KURNAZ et al. (2019)
38. Üsküdar, İstanbul	41.01461, 29.05911	2019	KURNAZ et al. (2019)
39. Tuzla, İstanbul	40.88312, 29.36118	2019	KURNAZ et al. (2019)
40. Beyoğlu, İstanbul	41.03393, 28.97775	2019	KURNAZ et al. (2019)
41. Sancaktepe, İstanbul	40.98719, 29.238861	2019	KURNAZ et al. (2019)
42. Osmangazi, Bursa	40.20387, 29.06643	2019	KURNAZ et al. (2019)
43. Darıca, Kocaeli	40.78455, 29.40814	2019	KURNAZ et al. (2019)
44. Gebze, Kocaeli	40.82283, 29.43264	2019	KURNAZ et al. (2019)
45. Adapazarı, Kocaeli	40.81887, 30.41432	2019	KURNAZ et al. (2019)
46. Adalar, İstanbul	40.86019, 29.12063	2022	https://www.inaturalist.org/observations/119590419
47. Çerkezköy, Tekirdağ	41.28236, 28.00058	2021	https://www.inaturalist.org/observations/108965344
48. Vize, Kırklareli	41.6343, 28.08466	2010	https://www.inaturalist.org/observations/67451196
49. Sarıyer, İstanbul	41.10253, 29.03057	2022	https://www.inaturalist.org/observations/134033744
50. Beylikdüzü, İstanbul	41.00894, 28.62595	2022	https://www.inaturalist.org/observations/133444620
51. Beşiktaş, İstanbul	41.04972, 29.01501	2022	https://www.inaturalist.org/observations/132914001
52. Sarıyer, İstanbul	41.15388, 29.03328	2022	https://www.inaturalist.org/observations/132598180
53. Kartepe, İstanbul	40.73245, 30.16265	2022	https://www.inaturalist.org/observations/130208681
54. Sultangazi, İstanbul	41.09397, 28.87346	2022	https://www.inaturalist.org/observations/126669258
55. Büyükçekmece, İstanbul	41.02196, 28.5709	2022	https://www.inaturalist.org/observations/126487022
56. Heybeliada, İstanbul	40.87149, 29.07718	2022	https://www.inaturalist.org/observations/126348668
57. Beşiktaş, İstanbul	41.06568, 29.03032	2022	https://www.inaturalist.org/observations/126199584
58. Sarıyer, İstanbul	41.1368, 29.03264	2022	https://www.inaturalist.org/observations/125339417
59. Sancaktepe, İstanbul	41.0041, 29.27814	2022	https://www.inaturalist.org/observations/124522480
60. Avcılar, İstanbul	40.99629, 28.72911	2022	https://www.inaturalist.org/observations/119212033
61. Beykoz, İstanbul	41.22719, 29.21646	2022	https://www.inaturalist.org/observations/119095997
62. Heybeliada, İstanbul	40.87249, 29.09148	2017	https://www.inaturalist.org/observations/118494154
63. Çaycuma, Zonguldak	41.57355, 32.03291	2022	https://www.inaturalist.org/observations/116257756
64. Ümraniye, İstanbul	41.055484 29.095957	2022	https://www.inaturalist.org/observations/115516892
65. Kınalıada, İstanbul	40.910631 29.040195	2022	https://www.inaturalist.org/observations/112560650
66. Sarıyer, İstanbul	41.177756 28.980625	2022	https://www.inaturalist.org/observations/111814507
67. Kartal, İstanbul	40.892164 29.193519	2021	https://www.inaturalist.org/observations/95128671
68. Şile, İstanbul	41.14317, 29.6465	2021	https://www.inaturalist.org/observations/70200640
69. Fatih, İstanbul	41.0061, 28.97461	2018	https://www.inaturalist.org/observations/65714865

Location	Coordinates	Record Year	Reference
70. Sarıyer, İstanbul	41.213861 29.108645	2011	https://www.inaturalist.org/observations/18087260
71. İzmit, Kocaeli	40.82134, 29.92428	2019	https://www.inaturalist.org/observations/35537375
72. Pendik, İstanbul	40.92667, 29.28884	2020	https://www.inaturalist.org/observations/45308943
73. Darıca, Kocaeli	40.78489, 29.36889	2011	https://www.inaturalist.org/observations/63315052
74. Sarıyer, İstanbul	41.24905, 28.98778	2020	https://www.inaturalist.org/observations/64105417
75. Küçükçekmece, İstanbul	40.98776, 28.77242	2020	https://www.inaturalist.org/observations/65078107
76. Karesi, Balıkesir	39.65234, 27.8982	2021	https://www.inaturalist.org/observations/86279860 (southernmost record known to date in Turkey).
77. Eskiçağa, Bolu	40.80652, 32.03305	2020	This study

Results and discussion

According to direct observations and literature reviews, the distribution of the species was found to be wider as predicted biogeographically (KURNAZ et al. 2019). In this study, two new records of the species outside its known distributional range are provided. With these two new records (76th and 77th in table 1), the distributional range of the species has been extended approximately 100 km southwards from both Black Sea and Marmara regions in accordance with the climatic conditions. On the other hand, there is also a need for detailed molecular and phylogenetic studies to be conducted on the *Podarcis siculus* populations in Turkey. Further research is needed to detail the distribution map of the species.

Moreover, considering it is a species that prefers near wetland and near coastal rocky habitats, it is likely that *Podarcis siculus* distributes alongside the Filyos River (aka Yenice River) which is brought together by the smaller rivers coming from the Koroğlu Mountains,

Bolu Mountains and Ilgaz Mountains. Stretching for 228 kilometers, the stream flows into the Black Sea in Filyos town of Zonguldak (Atlas Magazine, December 2009, Edition 201, pp. 56-74) where *Podarcis siculus* populations are abundant. Consequently, this study clearly proves that *Podarcis siculus* current distribution range reaches further south in Turkey.

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References

- ARNOLD, E.N. (1973): Relationships of the Palaearctic lizards assigned to the genera *Lacerta*, *Algyroides* and *Psammotromus* (Reptilia: Lacertidae). – Bull. Br. Mus. (Nat. His.), Zool. **25**(8): 289–366.
- BARAN, İ. & M.K. ATATÜR (1998): Türkiye Herpetofaunası (Kurbağa ve Sürüngenler). – Çevre Bakanlığı, Ankara, 214 S.
- BARAN, İ., A. AVCI, Y. KUMLUTAŞ, K. OLGUN & Ç. ILGAZ (2021): Türkiye Amfibi ve Sürüngenleri. – Palme Yayınevi, 130 S.
- BAŞOĞLU, M., & Ü. BARAN (1977): Türkiye Sürüngenleri. Kısım I. Kaplumbağa ve Kertenkeleler. – Ege Üniversitesi Fen Fakültesi Kitaplar Serisi, No. 76, İzmir.

- ÇEVİK, İ.E. (1999): Taxonomic states of the lizards species living in Turkish Tharace (Lacertilia: Anguinae, Lacertidae, Scincidae). – Turkish Journal of Zoology, **23**: 23–35.
- HARRIS, D.J. & E.N. ARNOLD (1999): Relationships and evolution of wall lizards, *Podarcis* (Reptilia: Lacertidae) based on partial mitochondrial DNA sequences. – Copeia, **3**: 749–754.
- HENLE, K. & C.J.J. KLAVER (1986): *Podarcis sicula* (RAFINESQUE-SCHMALTZ, 1810) Ruineidechse. – S. 254 – 342 in BÖHME, W. (Hrsg.): Handbuch der Amphibien und Reptilien Europas, Echsen III (*Podarcis*). – Aula-Verlag, Wiesbaden, 434 S.
- HÜR, H., İ.H. UĞURTAŞ, & A. İŞBİLİR (2008): The Amphibian and Reptile Species of Kazdağı National Park. – Turkish Journal of Zoology, **32**: 359–362.
- ILGAZ, Ç., Y. KUMLUTAŞ & M. SÖZEN (2013). New locality record for *Podarcis siculus hieroglyphicus* (BERTHOLD, 1842) (Squamata: Lacertidae) in the western Black Sea region of Anatolia. – Turkish Journal of Zoology, **37**(1): 123–127.
- KURNAZ, M., A.İ. EROĞLU, H. KOÇ-GÜR, U. BÜLBÜL & B. KUTRUP (2019): The Potential Distribution and Morphological Data of *Podarcis siculus* (RAFINESQUE-SCHMALSTZ, 1810) with New Locality Records from Turkey (Squamata:Sauria:Lacertidae). – Russian Journal of Herpetology, **26**(2):77–86.
- MOLLOV, I. (2009): A New Locality of the Italian Wall Lizard *Podarcis siculus* (RAFINESQUE-SCHMALTZ, 1810) from Turkey. – ZooNotes, **6**: 1–3.
- OLIVERIO, M., R. BURKE, M.A. BOLOGNA, A. WIRZ & P. MARIOTTINI (2001): Molecular characterization of native (Italy) and introduced (USA) *Podarcis sicula* populations (Reptilia, Lacertidae). – Italian Journal of Zoology, **68**: 121–124.
- PODAR, M., W. MAYER & N. TVRTKOVIC (2005): Phylogeography of the Italian wall lizard, *Podarcis sicula*, as revealed by mitochondrial DNA sequences. – Molecular Ecology, **14**: 575–588.
- PROVINE, W.B. (2004): Ernst Mayr: Genetics and speciation. – Genetics, **167**(3): 1041–1046.
- RAFINESQUE-SCHMALTZ, C.S. (1810): Caratteri di alcuni nuovi generi e nuove specie di animali e piante della Sicilia. – Sanfilippo, Palermo, 105 S.
- SINDACO, R., A. VENCHI, G. CARPANETO & M. BOLOGNA (2000): The reptiles of Anatolia. A checklist and zoogeographical analysis. – Biogeographia, **21**: 441–554.
- SPEYBROECK, J., W. BEUKEMA, B. BOK & J. VAN DER VOORT (2016): Field Guide to the Amphibians & Reptiles of Britain and Europe. – British Wildlife Field Guides Bloomsbury, 432 S.
- TOK, C.V., K. ÇİÇEK, S. HAYRETDAG, Y. TAYHAN & B.Y. YAKIN (2015): Range extension and morphology of the Italian wall lizard, *Podarcis siculus* (RAFINESQUE-SCHMALTZ, 1810) (Squamata: Lacertidae), from Turkey. – Turkish Journal of Zoology, **39**(1): 103–109.
- UĞURTAŞ, İ.H., H.S. YILDIRIMHAN & M. ÖZ (2000): Two new localities of *Lacerta sicula hieroglyphica* BERTHOLD, 1842 (Reptilia, Lacertidae). – Turkish Journal of Zoology, **24**: 253–256.
- WILLIAM, R., & JR. CATTON (2009): Bottleneck: Humanity's Impending Impasse. – Xlibris Corporation, 290 S.