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New country record and range extension of *Eremias suphani* Başoğlu & Hellmich, 1968 from Iran

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***Abstract.*—Iran is located in an area that is bordered by several mountains and contains herpetofaunal constituents from adjacent countries such as Pakistan, Iraq, Afghanistan, and Turkey. We surveyed several border provinces of Iran to more completely understand the Iranian herpetofauna. During one survey in the northwestern part of Iran we found a species of the genus *Eremias* that can be added to Iran's herpetofauna. Previously, the distribution of *Eremias suphani* was limited to the Van Lake in Turkey (type locality). We compared Iranian samples with *E. suphani* from Turkey using a molecular marker (Cytochrome *b*) and confirmed that this species is also present in Iran. The new record of this species is located on the road from Firoragh to Chaldoran in the west of the province of Azarbaijan, Iran.**

Key words. *Eremias suphani*, Iran, Turkey, new record, molecular marker

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Introduction

The herpetofauna of Iran remains poorly documented and in some isolated areas completely unknown (Anderson 1999). Historically, the Iranian herpetofauna has been studied by several foreign herpetologists (Mertens 1957; Anderson 1966, 1999; Leviton et al. 1992; Tuck 1971, 1974) who visited Iran, as well as by Iranian herpetologists (Latifi 1991; Balouch and Kami 1995; Kami and Vakilipoure 1996a, 1996b; Firouz 2000; Rastegar-Pouyani et al. 2007). Nonetheless, herein we report the presence of a previously undocumented species from the country. According to the recent published data, 15 species of the genus *Eremias* exist in Iran (Hosseinian Yousefkhani et al. 2013), to which we add another.

Eremias suphani (Suphan Racerunner) was considered to be confined to Turkey, where it was described from Van Lake (Başoğlu and Hellmich 1968), with some additional populations of this species having been recorded from western Turkey (Bischof and Böhme 1980). The species is morphologically similar to *Eremias strauchi*, its putative sister species, but there are differences in scalation (Bischof and Böhme 1980).

Adults of *Eremias suphani* can be distinguished from *E. strauchi* by the presence of a double or single row of gular scales separating the scales of the third pair of chin shields (third pair of chin shields in contact in *E. strauchi*), the presence of enlarged gular scales bordering the third pair of chin shields (no enlarged gulars in *E. suphani*), and the presence of a ventrolateral row of well-defined, large, round, white spots, that may be fused to form a longitudinal band (diffuse small longitudinal spots or a diffuse thin line in *E. strauchi*).

The distribution of these two sister species meet in the Dogubayazit Depression in NE Turkey (Bischof and Böhme 1980). In Iran, *E. suphani* is found on compacted, loamy soil at the Iran-Turkey border. In Turkey, *E. suphani* also lives on pebbly/sand substrates with sparse vegetation (Franzen and Hecks 1999; Baran et al. 2012). Amphibian and reptile species that have a sympatric distribution with *E. suphani* include: *Bufotes variabilis*, *Pelophylax ridibundus*, *Rana macrocnemis*, *Testudo graeca*, *Trapelus lessonae*, *Ophisops elegans*, and *Lacerta media*. *Eremias suphani* is listed as Least Concern because, although its extent of occurrence is less than 20,000 km^2, it is common with large population sizes, no major threats, and it is unlikely to be declining fast enough to qualify for listing in a more threatened category (Kaska et al. 2013).

Herein we report a new Iranian country record for *E. suphani*, confirmed using a molecular marker (Cytochrome *b*).

Materials and Methods

The Iranian samples were collected during field trips to the northwest of the country in June 2005 on the road

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Figure 1. Habitat of *Eremias suphani* in NW Iran on the road from Firoragh to Chaldoran in Ali Sheykh village (Photo by Eskandar Rastegar-Pouyani, 2005).

from Firoragh to Chaldoran, at the village of Alishekh (Fig. 1) (E 44° 34′ 78.4″, N 38° 49′ 22.1″, elevation: 1934 m). Four specimens were collected (SUHC 310-313) (Fig. 2) and deposited in the Sabzevar University Herpetological Collection (SUHC), Iran. The sites of the new records near the border of Iran-Turkey are provided in Figure 3. Turkish specimens were collected from three different localities in 2010 and 2012 (Aydınlar Village, Adilcevaz, Bitlis—between Tatvan and Bitlis km 4, Bitlis—Hoşap, Güzelsu, Van). They were deposited in the Biology Laboratories of Dokuz Eylül University, İzmir, Turkey.

DNA was obtained from tissue samples (muscle or liver) that were preserved in 96% ethanol (Rastegar-Pouyani et al. 2010). DNA was extracted using a high salt method (Kabir et al. 2006). Fragments of Cytochrome *b* were amplified (PCR) using the primers Mtanew (5′-CTC CCA GCC CCA TCC AAC ATC TCA GGA TGA TGA AAC-3′) and Mtfsh (5′-TAG TTG GCC AAT GAT GAT GAA TGG GTG TTC TAC TGG-3′). Sequences from three specimens of *E. strauchi* and five specimens of *E. suphani* from Turkey where compared with the Iranian samples using MEGA 5.0 software (Table 1). The sequences have been deposited in the GeneBank with accession numbers from KF797802 to KF797813.

Results

Genetic distance (Table 2) indicates that the Iranian samples are very close to *Eremias suphani* of Turkey with only about 2% of genetic distance. Distances between *Eremias strauchi* population and both *Eremias suphani* and *Eremias* sp. samples from Iran, are 16%. *Eremias* sp. samples from Iran now confirmed as *Eremias suphani*.

In addition to previous studies on the Iranian herpetofauna, our initial research in the NW corner of Iran revealed the presence of *Eremias suphani* in Iran. We focused our search in NW Iran to the border of Turkey for other localities, but in the other locations *Eremias strauchi* has been recorded.

Table 1. Examined samples in this study along with their locality and coordinates.

Code	Species name	N	E	Elevation	Locality
Str-1	*Eremias strauchi*	39° 51′ 57.1″	42° 29′ 03.3″	864 m	Between Aralık and Gündoğdu, Iğdır
Str-2	*Eremias strauchi*	39° 51′ 57.1″	42° 29′ 03.3″	864 m	Between Aralık and Gündoğdu, Iğdır
Str-3	*Eremias strauchi*	39° 51′ 57.1″	42° 29′ 03.3″	864 m	Between Aralık and Gündoğdu, Iğdır
SÜ2-A	*Eremias suphani*	38° 18′ 18.2″	43° 48′ 46.4″	1,997 m	Hoşap, Güzelsu, Van
SÜ2-B	*Eremias suphani*	38° 18′ 18.2″	43° 48′ 46.4″	1,997 m	Hoşap, Güzelsu, Van
SÜ2-C	*Eremias suphani*	38° 18′ 18.2″	43° 48′ 46.4″	1,997 m	Hoşap, Güzelsu, Van
SÜ1-B	*Eremias suphani*	38° 53′ 55.2″	42° 55′ 38.8″	2,000 m	Aydınlar village, Adilcevaz, Bitlis
SÜ1-C	*Eremias suphani*	38° 53′ 55.2″	42° 55′ 38.8″	2,000 m	Aydınlar village, Adilcevaz, Bitlis
SUHC 724	*Eremias* sp.	38° 49′ 22.1″	44° 34′ 78.4″	1,934 m	on the road from Firoragh to Chaldoran
SUHC 725	*Eremias* sp.	38° 49′ 22.1″	44° 34′ 78.4″	1,934 m	on the road from Firoragh to Chaldoran
SUHC 726	*Eremias* sp.	38° 49′ 22.1″	44° 34′ 78.4″	1,934 m	on the road from Firoragh to Chaldoran

Figure 2. General view of *Eremias suphani* from Iran. The color pattern of this species is different from *Eremias strauchi strauchi* (Photo by EskandarRastegar-Pouyani, 2005).

Discussion

Specimens of *Eremias* collected from Ahlat, Bitlis, in eastern Turkey were considered to be *Eremias velox* ssp. by Başoğlu and Hellmich (1959). In 1968, these authors examined specimens from Ahlat, Süphan Dağı, Mukus, and Van and described a new subspecies, *Eremias velox suphani*. Peters (1964) considered *E. velox strauchi* to be a full species (*E. strauchi*), whereas specimens collected from Doğubayazıt, Iğdır, and Kağızman were considered as *E. velox* by Clark and Clark (1973). Başoğlu and Baran (1977) stated that *E. suphani* and *E. strauchi* are subspecies of *E. velox* whereas Bischoff (1978) suggested that *E. suphani* is a subspecies of *E. strauchi*. Finally, *E. velox suphani* was regarded as a distinct species by Bishoff and Böhme (1980).

Eremias suphani is considered to be endemic to eastern Turkey, where it is known from the vicinity of Lake Van (Mulder 1995; Franzen and Heckes 1999; Baran et al. 2012).

According to the previous studies on the Iranian herpetofauna (Leviton et al. 1992; Anderson 1999; Rastegar-Pouyani et al. 2007, 2008), *E. suphani* has not been recorded from Iran. During field trips to northwest Iran in 2005, four specimens from a population belonging to the genus *Eremias* were collected that were not compatible with diagnostic key of the Iranian species of *Eremias*, but were comparable to *E. strauchi*. Considering these observations we assumed that these specimens represented a new species of *Eremias*, and decided to compare the specimens with individuals of other species of the genus that were described and previously recorded from the region, specifically *Eremias strauchi* and *Eremias suphani*. Genetic analysis revealed that the Iranian samples clustered (with 2% distance) with *E. suphani* and not with *E. strauchi* (16% distance). This new country record demonstrates how the border regions of Iran have not been carefully investigated, and that additional effort must be made to document reptile diversity in these areas.

These results strongly suggest that the Iranian samples are conspecific with *Eremias suphani*. Consequently, we conclude that *Eremias suphani* is recorded for the first time in Iran near the border with Turkey on the road from Firoragh to Chaldoran in Ali Sheykh village.

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Table 2. Estimates of evolutionary divergence (p–distance) over sequence pairs between samples of *Eremias* in this study.

	Eremias suphani Turkey	*Eremias* sp. Iran Firoragh	*Eremias strauchi strauchi*
Eremias suphani Turkey	—	0.022	0.193
Eremias sp. Iran Firoragh	0.022	—	0.166
Eremias strauchi strauchi	0.193	0.166	—

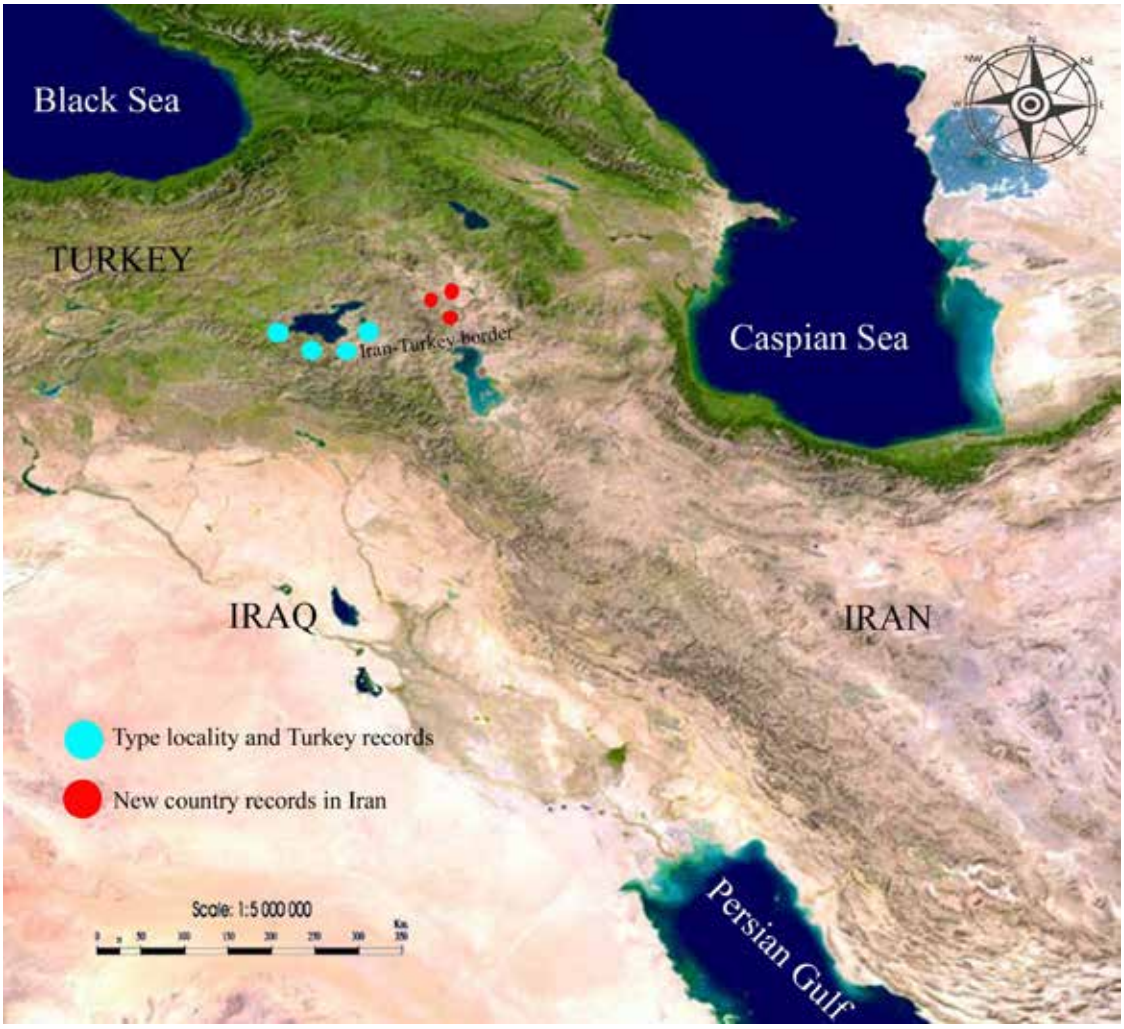

Figure 3. Iran-Turkey map and localities of new records in Iran and the type locality of *Eremias suphani* around the Van Lake in Turkey. Red circles relate to new country records in Iran and the blue circles are type localities of the Turkish samples.

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Appendix I. List of the material examined in this study and their accession numbers.

Species name	Country	Accession Number
Eremias suphani	Turkey	KF797802
Eremias suphani	Turkey	KF797803
Eremias suphani	Turkey	KF797804
Eremias suphani	Turkey	KF797805
Eremias suphani	Iran	KF797806
Eremias suphani	Iran	KF797807
Eremias suphani	Iran	KF797808
Eremias suphani	Iran	KF797809
Eremias strauchi strauchi	Iran	KF797810
Eremias strauchi strauchi	Iran	KF797811
Eremias strauchi strauchi	Iran	KF797812
Eremias strauchi strauchi	Iran	KF797813