

Contribution to the knowledge of *Eremias trauchi trauchi* Kessler, 1878 (Sauria: Lacertidae) from northwestern Iran

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In this study a total of 29 *Eremias trauchi trauchi* specimens (10 males, 16 females and three juveniles), collected from different localities in northwest of Iran were examined. The study was based on morphological features including color pattern, morphometric measurements, pholidotic characters, as well as ecological and biological observations especially habitat, reproductive biology and distribution. Habitat features and new distribution localities were documented. Egg characters of *Eremias trauchi trauchi* such as shape, size, number and color are reported for the first time. Also, some other new information on this species has been given.

Key words: Lacertidae, *Eremias trauchi trauchi*, morphological features, northwest of Iran.

INTRODUCTION

So far, 27 species belonging to the genus *Eremias* have been recognized. They are distributed in northern China, Mongolia, Korea, Central Asia, to southern Europe, south through the Iranian Plateau to Baluchistan (Anderson, 1999). This genus is comprised of 13 species in Iran and a new species has been discovered in recent years (Rastegar-Pouyani and Rastegar-Pouyani, 2001). Three species, *Eremias pleskei*, *Eremias arguta* and *Eremias trauchi trauchi* are found in northwest of Iran (Bischoff, 1978; Hillmann, 2003). In Iran, *trauchi* racerunner is represented by two subspecies, *Eremias trauchi trauchi* Kessler, 1878 and *Eremias trauchi kopetdaghica* Szczerbak, 1972 (Firouz, 2000). *Eremias trauchi trauchi*, is distributed in northwest of Iran, extending into Armenian Plateau of Azerbaijan and Armenia (to about 3500 m) and northeast of Turkey (Franzen and Ullrich, 1999; Leviton *et al.*, 1992; Tadevosyan, 2006). The second subspecies is found in northeast of Iran, Khorasan and Golestan provinces (Khademi, 2005).

Some previous surveys have been performed on *Eremias trauchi* (Franzen and Ullrich, 1999; Bischoff, 1978). This species is not well studied in part of its wide distribution range. So, in the present investigation based on field data, we studied color pattern, morphometric measurements, pholidotic characters, distribution, habitat and reproduction of this species in Iran.

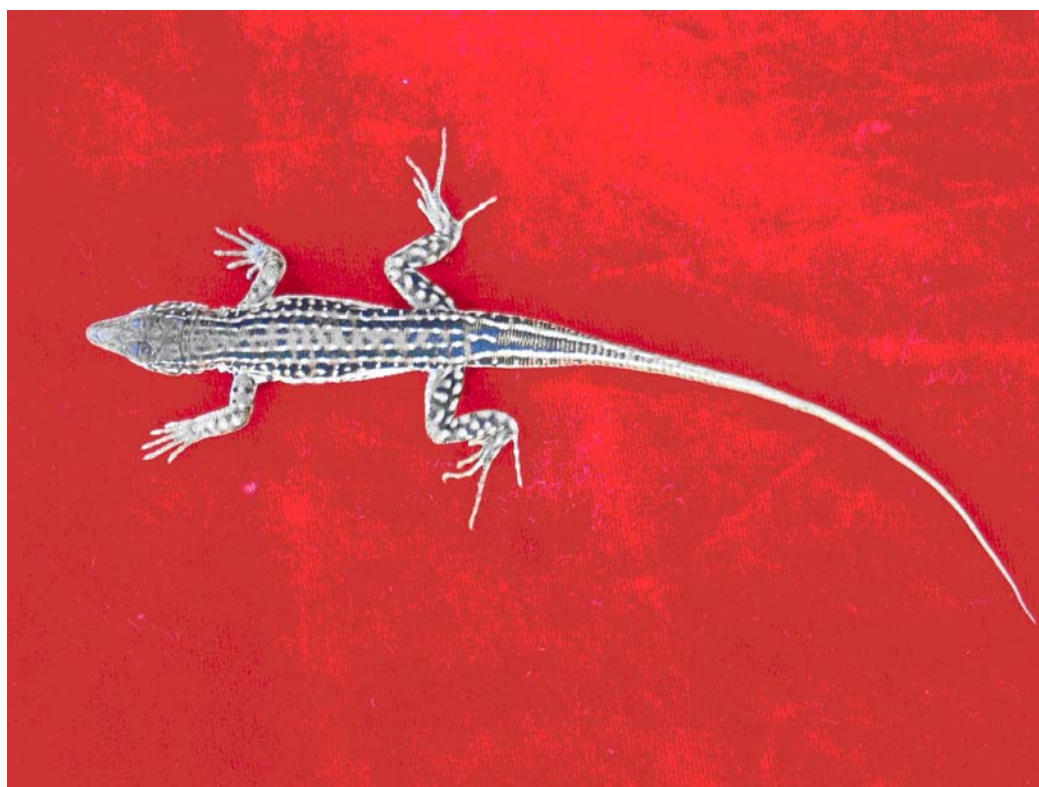


FIG.1.- *Eremias trauchi trauchi*



FIG.2.- Color pattern in *Eremias trauchi trauchi* one juvenile (right) and two adults (left)

MATERIAL AND METHODS

STUDY AREA

The study area is northwest of Iran including, Ardabil, East and West Azerbaijan provinces (Fig.3). This area is surrounded by Alborz Mountains and the Caspian Sea in the east, Aras village in the north, Turkey in the west and Zanjan and Kurdistan in the south. The Gare-Dagh, Sabalan chains and Sahand are most important mountains in the area. Its altitude ranges between 20 m in the Moghan steppe to 4888 m on the Sabalan Mountains. Also Arasbaran protected area and the Urmia Lake are special natural ecosystems in the area (Afshar, 1991). In phytogeographical approach, mentioned zone is situated in Irano-Turanian region that reveals steppe formations (Zohary, 1973). Plants species identifying was performed by using Flora Iranica (Rechinger, 1963-1999).

METHODS

The study was carried out between October 2003 and June 2005. We employed several methods to collect the samples. Since the area was vast, extensive field work was conducted. All of the samples were caught by hand and some specimens were captured by shooting. Locality data and their habitat features were recorded for all the specimens encountered during the study. The specimens were preserved according to standard methods and stored in the collection of Shahid Beheshti University. Identification of the specimens collected during the study period was made by using the current literature (Leviton, *et al.*, 1992; Anderson, 1974, 1999). Morphometric measurements were taken using dial calipers with an accuracy of 0.02 mm. Pholidotic characters counts were performed by using optical Stereomicroscope ZSM-1001.

TABLE 1. Morphometric characters of *Eremias strauchi strauchi* (females) collected from northwest of Iran. (Snout-Vent Length (SVL), Tail Length (TL), Head Length (HL), Head Width (HW), Standard Deviation (SD), Sample Size (N)).

Characters	N	Mean	SD	Minimum	Maximum
SVL	16	064.96	03.86	58.26	70.28
TL	16	108.58	08.20	97.02	125.00
HL	16	015.69	01.08	14.08	17.02
HW	16	007.57	00.40	07.00	08.40
SVL/TL	16	000.59	00.02	00.56	00.62
SVL/HW	16	008.58	00.27	08.25	09.34
SVL/HL	16	004.14	00.23	03.81	04.60
HL/HW	16	002.07	00.12	01.88	02.30

TABLE2. Morphometric characters of *Eremias strauchi strauchi* (males) collected from northwest of Iran. (Snout-Vent Length (SVL), Tail Length (TL), Head Length (HL), Head Width (HW), Standard Deviation (SD), Sample Size (N)).

Characters	N	Mean	SD	Minimum	Maximum
SVL	10	64.01	04.09	60.22	71.00
TL	10	108.54	11.46	95.00	128.00
HL	10	015.26	01.09	14.12	17.02
HW	10	007.65	00.32	07.08	08.02
SVL/TL	10	000.59	00.02	00.55	00.64
SVL/HW	10	008.36	00.39	07.73	08.88
SVL/HL	10	004.19	00.16	03.85	04.42
HL/HW	10	001.99	00.12	01.85	02.21

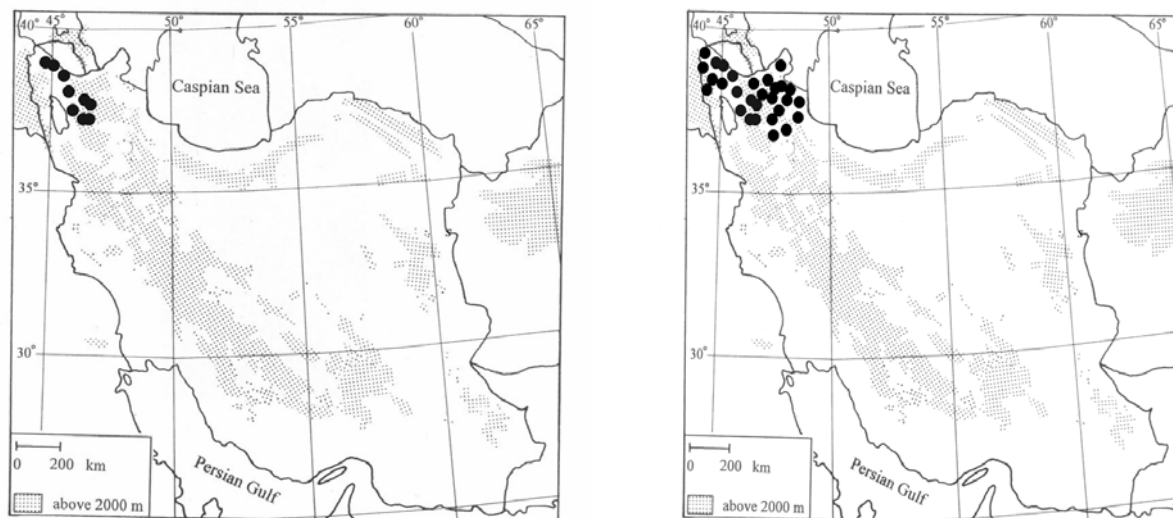


FIG.3.- Distribution range of *Eremias trauchi trauchi* and the locations which in has been recorded in Iran: old records (Anderson, 1999) (left) and new records (right)

RESULTS

MORPHOMETRIC MEASUREMENTS

The morphometric measurements taken from the specimens are given in Tables 1 and 2. Both sexes were treated separately. The longest male specimen was 71 mm snout-vent length with a 128 mm tail length. The mean snout-vent and tail length in males (N=10) are 64.01 and 108.54 mm, respectively. Head Length (HL) ranges between 14-17mm. The minimum and maximum snout-vent lengths in female samples were 25.26 and 70.28 mm, respectively. Other morphometric characters of adult specimens are given in Tables 1 and 2. Some morphometric characters of three juvenile specimens are given in Table 3.

PHOLODOTIC CHARACTERS

Meristic data are given in Tables 4 and 5. The mean number of ventral plates (longitudinal and transversal) in females is 31.18 and 14.93 respectively. The number of supralabial and infralabial scales in both sexes was between five and seven. Number of upper labials (right) rarely reaches four. Also, in both sexes the number of inframaxillary scales is constant (five pairs) and number of femoral pores ranges from 21 to 23. Other meristic characters of adult specimens are given in Tables 4 and 5.

TABLE3. Morphometric characters of three juveniles of *Eremias trauchi trauchi*. (Snout-Vent Length (SVL), Tail Length (TL), Head Length (HL), Head Width (HW)).

Characters	1	2	3
SVL	41	48	56
TL	71.28	79.12	85.36
HL	11	11.50	12.02
HW	4.02	4.16	4.24

TABLE 4. Pholidotic characters of *Eremias trauchi trauchi* (females) collected from northwest of Iran. (Number of plates in transversal widest ventral row (TWR), Number of plates in tallest longitudinal ventral row (TLR), Supralabial plates (left-right) (SRLl-SRLr), Sublabial plates (left-right) (SLl-SLr), Inframaxillar (left-right) (Il-Ir), femoral pores (left-right) (FPl-FPr).

Characters	N	Mean	SD	Minimum	Maximum
TWR	16	14.93	0.85	14	16
TLR	16	31.18	0.83	30	32
SRLl	16	05.46	0.51	5	6
SRLr	16	05.50	0.96	4	7
SLl	16	05.93	0.85	5	7
SLr	16	05.87	0.71	5	7
Il	16	04.93	0.25	4	5
Ir	16	04.87	0.34	4	5
FPl	16	22.12	0.77	21	23
FPr	16	22.12	0.80	21	23

COLOR PATTERN

The color pattern features do not differ greatly among populations. Common ground color is olive gray. There are two prominent dorsolateral dark stripes on each side of back with dark- margined ocelli continuing onto the neck and onto anterior part of tail (Fig.1). In juveniles, there are 6-7 longitudinal dark and light lines starting from head and meeting on tail (Fig.2- right). White lines transform into rows of spots in adults. In adults the vertebral area is uniform without stripe or spots (Fig.2- left). The number of light spots on flanks in juvenile specimens is more than adults (Fig.2).

DISTRIBUTION

The new record localities were added to distribution map of this subspecies in Iran. Previously, this subspecies had been collected from western and central Azerbaijan including Jolfa and Makran protected region, Kartevevui near Maragheh, Maragheh paleo site, 45 km SE Tabriz, Talkheh Rud , 21 Km E Maku on the road to marand, marand, NW corner Darycheh Urmieh (Figure3- left) (Anderson, 1999). However, there were no records from eastern part of area especially in Ardabil province. In this study some new distribution localities are reported. A range of new localities from north to south of Ardabil province, respectively, Anjirlu, Hamze-Khanlu, Taze-kand (Ongut), Gabale-Kandi and Gasem-kandi in Germy city, Amirkandi, Salvat, Moradlu, Goshee Sofla and Razey in Arshag area, Arbab-Kandi, Kangarlu and Gaderlu in Meskinshahr and Anbaran, Namin, Samian, Kalkhoran, Abi-Biglu, Hir, Budalalu, Abas-Abad , Kuracim and Nir around Ardabil city are represented. Also some other localities in different parts of the area are documented (Fig.3- right).

TABLE 5. Pholidotic characters of *Eremias trauchii trauchii* (males) collected from northwest of Iran. (Number of plates in transversal widest ventral row (TWR), Number of plates in tallest longitudinal ventral row (TLR), Supralabial plates (left-right) (SRLl-SRLr), Sublabial plates (left-right) (SLl-SLr), Inframaxillar (left-right) (Il-Ir), femoral pores (left-right) (FPl-FPr).

Characters	N	Mean	SD	Minimum	Maximum
TWR	10	14.90	0.94	14	16
TLR	10	31.45	0.68	30	32
SRLl	10	05.72	0.78	5	7
SRLr	10	05.54	1.035	4	7
SLl	10	05.90	0.83	5	7
SLr	10	05.90	0.70	5	7
Il	10	04.90	0.30	4	5
Ir	10	05.00	0.00	4	5
FPl	10	22.12	0.89	21	23
FPr	10	22.00	0.89	21	23

TABLE 6. The table showing diameter (mm), length (mm) and weight (gr) of five eggs of *Eremias trauchii trauchii*.

Eggs	1	2	3	4	5
Diameter (mm)	7.32	6.52	6.42	6.52	6.48
Length (mm)	12.62	12.72	11.80	11.00	11.00
Wight (gr)	0.22	0.21	0.22	0.20	0.21

HABITAT

The specimens were found in dry, stony plains, foothills and hillsides. They were also found under wheat straw in a harvested field. The dominant vegetation was composed of cushion, shrubs, grasses and many annual plants. The structure and form of these plants provide many habitats for alpine fauna for other lizards and snakes that conceal in their canopy cover. The most indicator perennial plants are: *Berberis integrima*, *Thymus persicus*, *Thymus kotschyanus*, *Thymus pubescens*, *Achillea aucheri*, *Echinops pungens*, *Astragalus ebenoides*, *Astragalus cyclophyllon*, *Acantholimon oliveri*, *Acantholimon gilliatii*, *Acanthophyllum szowitzi*, *Acanthophyllum acerosum*, *Cotoneaster numularica*, and *Stachys inflata*. In grasslands for example there are: *Festuca rubra*, *Melica jacquimontii*, *Stipa* spp., and *Eremopyrum bonaepartis*. In destructed rangelands many ruderal plants are established such as: *Peganum harmala*, *Albagi* spp., *Cirsium hygrophyllum*, *Artemisia sieberi*, *Euphorbia seguieriana*, and *Euphorbia falcta*. Some annual plants in these habitas are: *Thalaspia kotschanus*, *Coringia perfoliata*, *Papaver refracta*, *Falcaria vulgaris*, *Ziziphora tenuir*, and *Bromus tectorum*.

Eremias lacertid lizards feed on insects and plants. They are very active hiding in shrubby vegetation. In many parts of distribution range *Eremias trauchii trauchii* is found syntopically with other lizards for example, *Eremias pleskei*, *Eremias arguta*, *Ophisops elegans*, *Trapelus lessonae*, *Ablepharus bivittatus* and *Trachylepis aurata transcaucasica*.



FIG. 4.- The eggs of *Eremias trauchi trauchi*.

REPRODUCTION

Egg-laying was not observed in nature but on a sunny day, five eggs of this lizard were found with female under an *Artemisia sieberi* shrub on June 14th 2004 in Amir-Abad Village on the road of Ardabil to Moghan (38° 51' 52" N, 47° 57' 25" E). Eggs were fresh with white color shield without any markings. Their color changed to yellowish in fixative (70% ethanol). The eggs were more or less cylindrical with round ends. Their surface is smooth (Fig.4). Diameter, length and weight of five eggs of *Eremias trauchi trauchi* are given in Table 6.

DISCUSSION

Our study was conducted to learn more about the morphological characters, distribution, habitats and reproduction of Strauch's racerunner, *Eremias trauchi trauchi*. According to Anderson (1999) and others (Hillmann, 2003) distribution of *Eremias trauchi trauchi* in Iran has been limited to small areas in central part of Azerbaijan, whereas we showed that this species is distributed throughout the study area. It is common throughout the open plains and slopes of area and also is found on open steppes with variety of surfaces including gravel, sand and loams same to *Eremias trauchi kopetdaghica* (Khademi, 2005; Szczerbak, 1994). We could not find specimens in some region due to habitat loss. Morphological characters based on Anderson (1999) were studied. It was very interesting to see growth and color change in juvenile specimens. Color pattern was described according to specimens from juveniles to adults in life. This pattern is also common in some other *Eremias* species. For such a relatively common and widespread lizard there are few detailed data of reproduction. For the first time, egg characters like shape, size and color are reported in this study from Iran. To determine other reproductive features, more studies have to be done in natural environments.

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