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Male of *T. kurdistanicus*, Shaqlawa, Iraq.

Observations on distribution, ecology and colouration of the Kurdistan Ocellated lizard *Timon kurdistanicus* (SUCHOW, 1936) (Squamata: Lacertidae)

MARKUS AUER, FARHAD A. KHUDHUR, TORSTEN PANNER & FALK ZÖNNCHEN, 2021

Abstract

The article describes observations on distribution, population density and social behavior of *Timon kurdistanicus* in Turkey, Iran and Iraq. The discovery of two different colour morphs in male *T. kurdistanicus* is noteworthy.

Zusammenfassung

Der Artikel berichtet von Beobachtungen zur Verbreitung, zur Populationsdichte und zum Sozialverhalten von *Timon kurdistanicus* in der Türkei, Iran und Iraq. Die Existenz von zwei verschiedenen Kehlfärbungstypen bei männlichen *T. kurdistanicus* ist bemerkenswert.

Introduction

The Kurdistan ocellated lizard was described first by SUCHOW (1936) as a subspecies of *Lacerta princeps* from the border region of Iran and Iraq around Byara and Balkha, which is today at Iraqi territory. Meanwhile quite a number of localities were published and the known range of the species extends roughly from Mardin and Bitlis in Turkey to Sanandaj in Iran (BASOGLU 1945, WETTSTEIN-WESTERSHEIMB 1960, KHALAF 1961, EISELT 1968, RYKENA et al. 1977, ILGAZ & KUMLUTAS 2008, AHMADZADEH et al. 2012, AFRASIAB 2013, AKMAN et al. 2018, ARARAT pers. comm., BOK pers. comm., SCHNEIDER pers. comm.). A list of all published localities is given in table 1. The lizard species prefers oak forest that is growing along the foothills and hills of Western Zagros Mountains and in the flat South Anatolian hills.

SUCHOW (1936) did not mention the colour of the conserved specimens his description is based on. EISELT (1968 & 1969) describes the throat colour of adult males as orange-red. Though he did see only

specimens from Turkey (see table 1 for localities). From the few animals collected before, including the type series of *T. kurdistanicus*, the colour of throat is not known. The orange red colour seems to fade in the conservation liquid (EISELT 1968, own observations). This is a possible explanation why nobody so far noticed the existence of two different colour morphs in *Timon kurdistanicus*.

Material and methods

We checked all available literature to summarize data on the distribution of this lizard species. During a period of about ten years the authors visited different areas of the proposed and proven area of distribution of the species to investigate the colour of the lizards, beneath other natural history facts. In different years in springtime and summer the following areas were investigated: Turkey: Semdinli, Iraq: Barzan, Shaqlawa, Choman, Erbil, Sulaimaniyya, Halabja, Qaradagh, Darbandikhan, Iran: Khermanshah, Sanandaj, Marivan. Where possible we took photos of all life stages and sexes of the lizard.

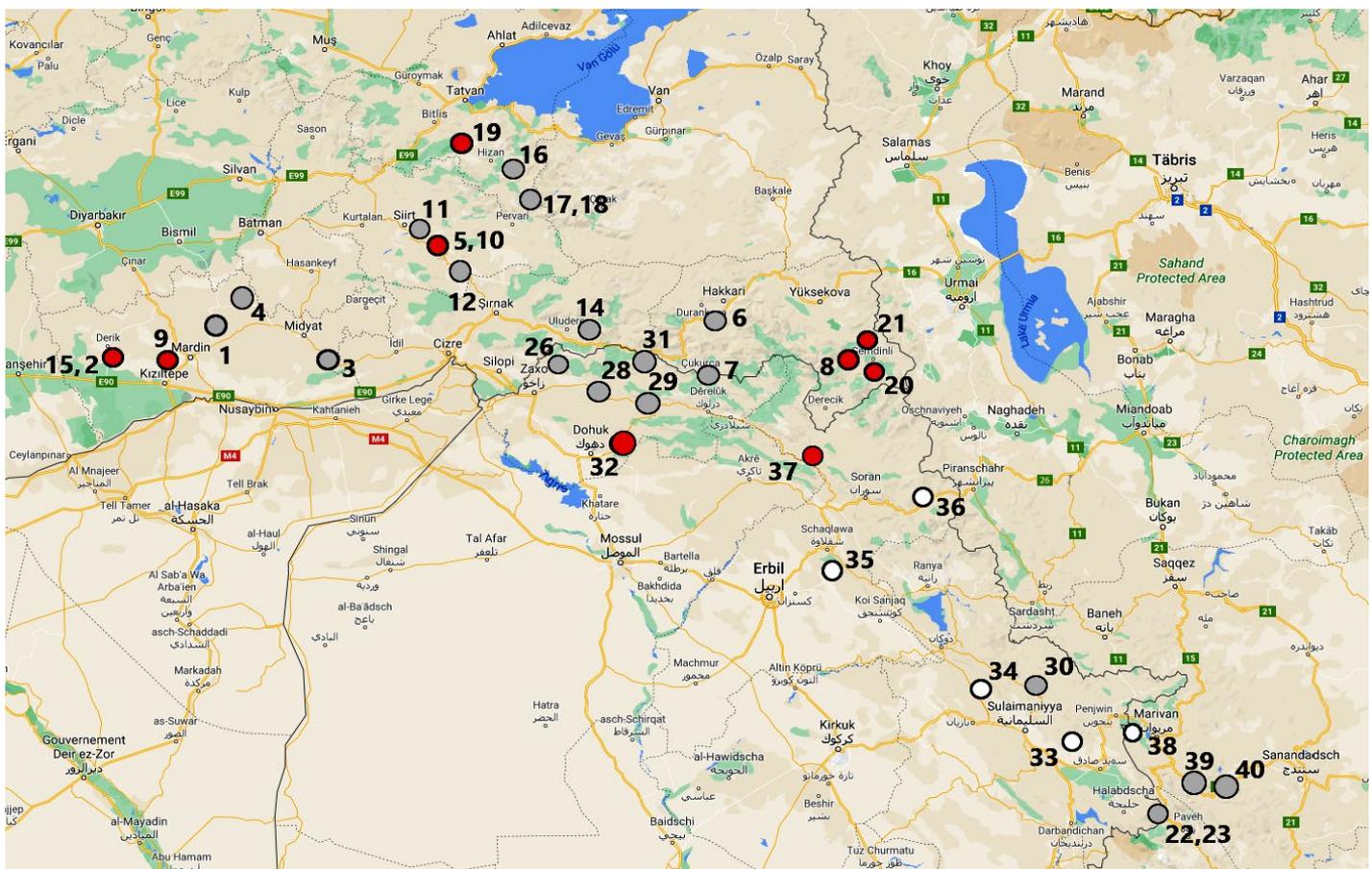


Fig. 1 – Map of the distribution of *Timon kurdistanicus*. Dark grey dots indicate a distribution record without information on the male throat colour. Red dots are proven records of the red morph. White dots are proven records of the white morph. Numbers refer to localities with references in table 1. (basic map: maps.google.com, 2020).

Table 1: Localities of *Timon kurdistanicus*

number	country	locality	source	colour of throat	comments
1	Turkey	Hüsseyini, Siirt prov.	Basoglu 1945 in Ilgaz & Kumlutas 2008		
2	Turkey	Derik, 45 km W Mardin	Eiselt 1968	red	
3	Turkey	15 km SE Midyat, Mardin prov.	Eiselt 1968		
4	Turkey	16 km ENE Savur, Mardin prov.	Eiselt 1968		
5	Turkey	10 km SW Baykan, Siirt prov.	Eiselt 1968		
6	Turkey	10 km SSW Hakkari	Eiselt 1968		
7	Turkey	Cukurca, Hakkari prov.	Eiselt 1968		
8	Turkey	8km W Semdinli	Eiselt 1968	red	
9	Turkey	surroundings of Mardin	Rykena, Nettmann & Bings 1977	red	pictures in www.lacerta.de
10	Turkey	19 km SE Siirt	Ilgaz & Kumlutas 2008	red	pictures in www.lacerta.de
11	Turkey	Cetinkol village, Eruh, Siirt prov.	Yildiz et al. 2009		
12	Turkey	Meyandere village, Siirt prov.	Yildiz et al. 2009		
13	Turkey	Siirt province	Sindaco 2011	red	pictures in www.lacerta.de
14	Turkey	Basaran, Sirnak prov.	Ahmadzadeh et al. 2012 & Ahmadzadeh et al. 2016		
15	Turkey	Derik, Mardin prov.	Ahmadzadeh et al. 2012 & Ahmadzadeh et al. 2016		
16	Turkey	Doganci, Hizan, Bitlis prov.	Akman et al. 2018		
17	Turkey	Sagirkaya, Hizan, Bitlis prov.	Akman et al. 2018		
18	Turkey	Hacimehmet, Hizan, Bitlis prov.	Akman et al. 2018		
19	Turkey	Basmakli, SE Bitlis	Schneider pers. comm.	red	
20	Turkey	Semdinli, Hakkari prov.	Schneider pers. comm.	red	pictures in www.lacerta.de
21	Turkey	Güzelkonak, N Semdinli Hakkari prov.	Auer pers. obs.	red	
22	Iraq	Biare, Iraq	Suchov 1936		Typus
23	Iraq	Balkha, Iraq	Suchov 1936		Paratypus
24	Iraq	Beljaki, Iraq	Suchov 1936		Paratypus
25	Iraq	Sureja	Suchov 1936		Paratypus
26	Iraq	Djebel Khantur at Sharanish (N Zakho), Iraq	Wettstein-Westersheimb 1960		female
27	Iraq	Sheikhan	Khalaf 1961		
28	Iraq	Sersang, 80 km NNE Mosul (between Dohuk & Amadia)	Khalaf 1961		
29	Iraq	Berray-Kur & Deyhoka bei Amadia	Niazi 1976		
30	Iraq	mountains north of Sulaimania	Afrasiab et al. 2013		
31	Iraq	Kanimase, Iraq	Afrasiab et al. 2013		
32	Iraq	Dohuk area, Iraq	Ararat pers. comm. 2014	red	
33	Iraq	Barzak, Iraq	Schneider pers. comm., Auer pers. obs.	white	
34	Iraq	Piramagroon, Iraq	Auer pers. obs.	white	
35	Iraq	Shaqlawa, Iraq	Auer pers. obs.	white	
36	Iraq	Choman, Iraq	Auer pers. obs.	white	
37	Iraq	Torishke, Iraq	Auer pers. obs.	red	
38	Iran	Nej, west of lake Marivan, Iran	Auer pers. obs.	white	
39	Iran	Sarvabad, Iran	Ahmadzadeh et al. 2012 & Ahmadzadeh et al. 2016		
40	Iran	7 km S Negel, Iran	Anderson 1999, in den Bosch 1998, Bok pers. comm.		

To estimate the number of individuals we walked transects through the habitat and searched the area on both sides as far as 10 meters. We repeated this by walking there and back until we filled a square of 1 to 2 hectares. Because of their escape strategy, it is easy to hear the sounds of individual lizards in the dry oak leaf litter or see them running in open fields and along branches.

Results and discussion

Habitat & population density

In its core area the species inhabits all suitable oak forests in different densities. Oak forests are used by men to cut wood. Therefore most of the forests are nowadays not more than a bushland compared to their original conditions. Nevertheless even in managed forests the species can thrive and reach quite high densities. Shelter and food availability seem to be the most important factors to survival of the lizards. The lizards use holes in the woody trunks of oak trees, rodent burrows and probably also self-dug holes on the base of the bushes and trees, and prefer those places with a lot of leaf litter. As the leaf litter seems to be best retained around bushes with many little and medium sized stems regrowing from one cut trunk, they benefit from extensively cut forests. Nearby patches of grass and wild flowers serve as hunting ground for the lizards. Grazing keeps these areas open but can also have a negative impact at the food source of insect predators if done too intensively.

The highest numbers of *Timon kurdistanicus* were found in Nej, Iran with 10 individuals per hectare. Here the oak forest is cut regularly but can regrow to bushes with the dimensions of 5 by 6 m (width x height). The distance between the bushes (open grass patches) is here 1 to 5 m. In a degraded patch of bush forest near Choman, Iraq, we found two specimens on one hectare, the bushes were small (3 x 3 m) with much wider space between them (2 to 15 m).

At Torishke, near Barzan in Iraq the oak forest was formed by mainly uncut trees of decent sizes scattered with bush like cut trees. The lizards here were found in all areas of the forest, in between the bushy patches and in the more shady areas between the mature trees, 5 individuals per hectare. The Piramagroon locality in Iraq used to have a good number of *T. kurdistanicus* in 2014, six individuals per hectare. During a visit in 2019 we found only two per hectare. The particular area is a southeast

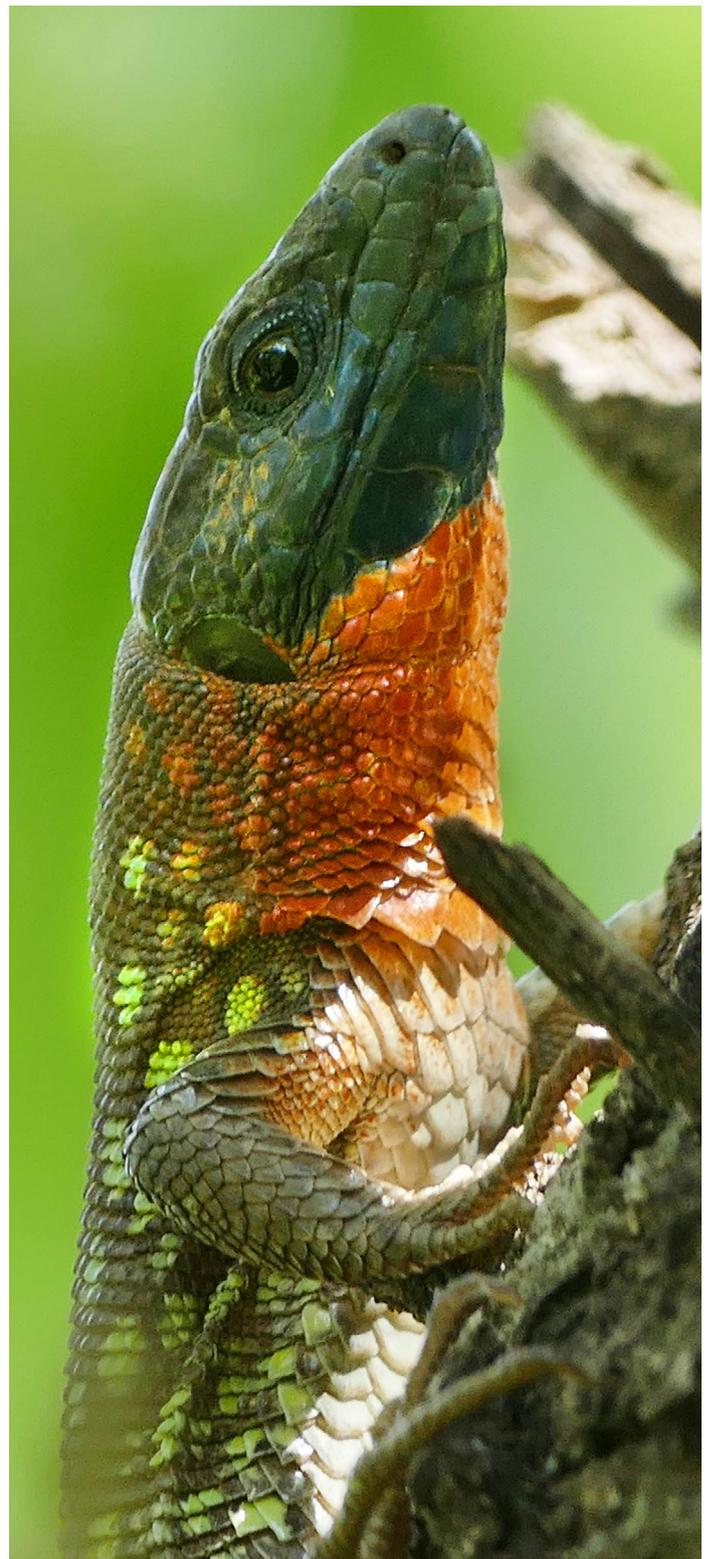


Fig. 2 – Male of the red morph, Torishke, Barzan area, Iraq.

slope above the village Zewe with a mixed broad leaf forest dominated by oaks. The area is used as a recreation and campsite during Kurdish weekends and holidays. The increased amount of visitors and free ranging cats could be one reason for the reduction of numbers in lizards here lately.

In Barzinja area near Basak, Iraq, we observed four specimen on 3 hectare of oak forest. The oaks here grow as small trees or bushes up to 5 m in height. The top of hills had only a low density of trees and bushes whereas the lower slopes were covered to 50% with them. On average the trees and bushes had distances of 2 to 4 m. We found the lizards in the denser vegetated areas. In May 2014 there was low impact from grazing of livestock and quite a good understory of grass and herbs between the trees and bushes.

Social behavior & habitat use

Only in two occasions we found the lizards together as pairs in one place, namely nearby a hollow on the base of an oak bush. These sightings took place in Choman, Iraq on 30. April 2019. Obviously the lizards took shelter in this “burrow” for some time as they basked close to it and retreated faintly when a disturbance appeared. It is of notice that in each case it was obvious that the male was bigger and older than the female. In contrast to its sister species *Timon princeps*, the sexes of *T. kurdistanicus* grow almost equally when adult. So one can assume if one partner of the pair is smaller it is younger. Usually the observed *T. kurdistanicus* were found solitary, most often basking on the ground around the edges of an oak bush. In 10 percent of the cases they were found basking on the trunk or a branch of the bushes or small trees. When disturbed they run

back to the next bush to hide in their burrow. We got the impression that they use one suitable burrow for a longer period of time if not for years. The nearest distance between two specimens was about 20 to 30 m in Nej, Iran. In contrast to the solitary behavior of *T. kurdistanicus*, other lizards of a similar size are found together as pairs more often, not only in spring, namely the Eastern Green lizard, *Lacerta media*.

The presence of water in form of springs and streams seems no requirement for the occurrence of *T. kurdistanicus*. In Güzelkonak, Turkey, there was a clear separation between the different lizard species. The Eastern Green Lizard, *Lacerta media*, was found on the meadows and between bushes near to the stream whereas *T. kurdistanicus* occurred on the bushy slopes above. In Nej, Iran, the Eastern Green lizard occupied bushes near a small stream and a wet meadow and the hillside around was home of *T. kurdistanicus*.

For some reason the situation in the Qaradagh Mountains in North Iraq is different. This mountain chain consists of folded and broken downthrown blocks with no permanent water bodies and practically no streams. This is one of the southernmost oak forests in North Iraq. Here we were not able to observe any Kurdistan Ocellated lizards but frequently Eastern Green lizards. In an area south east of Darbandikhan, that harbors also some remains of oak forest, neither *Timon kurdistanicus* nor *Lacerta media* where observed so far.



Fig. 3 – Young male of the red morph, Güzelkonak, Turkey.



Fig. 4 – Male of the white morph, Choman, Iraq.



Fig. 5 – Male of the white morph, Nej, Iran.



Fig. 6a – Male, white morph from Basak, Iraq.



Fig. 6b – Male, red morph from Torishke, Iraq.

Colouration

It is not known, what exactly the throat colouration of the type series was. During the field work for the present study it became obvious that there are differences in throat colouration between different populations of *T. kurdistanicus*. EISELT (1968) showed the first colour plates of *T. kurdistanicus* with red-orange throats. From several Turkish publications and on the websites red-throated specimens became known, too (RYKENA et al. 1977, ILGAZ & KUMLUTAS 2008, www.bayramgocmen.com, www.turkherptile.org). Because of the pictures from the internet and an observation in Güzelkonak (AUER pers. obs. 2010) the authors believed all male *T. kurdistanicus* do have red-orange throats. It was a surprising find that different populations of this lizard in the south, not far from the type locality, did not have this red-orange but white throats! In the consecutive field trips all found *Timon kurdistanicus* populations were checked regarding throat colour. Juveniles of all populations do not differ from each other. Females have usually creamy coloured throats that sometimes can show a white or pink hue, independent from their origin. During the year the colour of the male's heads can change from blue (after shedding in spring) over brown and grey to nearly black (on the sides of the head), however the throat colour in males is constant. Fig. 1 shows a map of hitherto known distribution

records and distribution of the two colour morphs. The putative border of these colour morphs is formed in the east by the high peaks around Halgurd-Sakran Mountain. In the west it seems some upper sections of Greater Zab River, the Harrir Mountain chain and the dry lowlands between Erbil and Shaqlawa could be the border. Until now, there is no population known, where these two colour morphs mix. This could be the case maybe for populations in Mardin area. There is a Turkish website that shows 3 different colour morphs for Mardin area (www.bayramgocmen.com). Here some more research is necessary to declare the situation.



Fig. 7 – Female of the white morph with some hue of pink on throat, Nej, Iran.



Fig. 8 – Female of *T. kurdistanicus* with white coloured throat, Shaqlawa, Iraq.



Fig. 10 – Female of *T. kurdistanicus* looking out of its burrow at the base of an oak bush, Choman, Iraq.



Fig. 9 – Female of *T. kurdistanicus* basking on an oak stem, Nej, Iran.



Fig. 11 – Male of *T. kurdistanicus* looking out of its burrow at the base of an oak bush, Choman, Iraq.



Fig. 12 – Habitat of *Timon kurdistanicus*, Nej, Iran.



Fig. 13 – Habitat of *Timon kurdistanicus*, Basak, Iraq.



Fig. 14 – Habitat of *Timon kurdistanicus*, Güzelkonak, Turkey.

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