

A New Species of *Eremias* (Sauria: Lacertidae) from Highlands of Kermanshah Province, Western Iran

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Abstract.- A new and distinctive species of the genus and subgenus *Eremias* is described from the highlands of Kermanshah Province, western Iran at about 1800 m elevation. It is easily distinguished from all other species of the typical subgenus (*E. velox*, *E. persica*, *E. strauchi*, *E. nigrolateralis*, *E. lalezharica*, *E. afghanistanica*, *E. regeli*, *E. suphani*, and *E. nikolskii*) by a variable number of postmentals (4-5 pairs), smaller size, and distinctive color pattern. Furthermore, it can be distinguished by having a combination of characters against any of the species in the typical subgenus. Systematics of the genus and subgenus *Eremias* is shortly discussed.

Key words.- Lacertidae, *Eremias*, *Eremias (Eremias) montanus*, Western Iran, Zagros Mountains, Kermanshah province, Siah-Darreh



Figure 1. Location of Kermanshah province on the Iranian Plateau.

Introduction

The lacertid genus *Eremias* Fitzinger, 1834 encompasses about 33 species of mostly sand, steppe, and desert dweller lizards which are distributed from northern China, Mongolia, Korea, Central and southwest Asia to southeastern Europe (Rastegar-Pouyani and Nilson, 1997). The genus is Central Asian in its relationships and affinities (Szczerbak, 1974). About 15 species of the genus *Eremias* occur on the Iranian Plateau mostly in northern, central, and eastern regions (Rastegar-Pouyani and Nilson, 1997; Anderson, 1999). To date, no comprehensive study has been carried out on *Eremias* fauna of the Iranian Plateau and the systematic status of most taxa is in great need of a revisionary work. Szczerbak (1974), however,



Figure 2. The type locality of *Eremias (Eremias) montanus*, vicinity of the Village of Siah-Darreh, about 60km northeast of the city of Kermanshah, Kermanshah Province, western Iran.

revised *Eremias* and divided it into two distinguished genera based on morphological characters: *Mesalina* Gray and *Eremias* Fitzinger (see under *systematic discussion*).

As the first record of *Eremias*, in this paper we describe and introduce a new species of this genus from the upland and mountainous regions of Kermanshah province, western Iran at about 1800 m elevation. This province is located on the western periphery of the Iranian Plateau (Fig. 1) and a major part of it is covered by the Zagros Mountains. The type locality of *Eremias (Eremias) montanus* (sp. nov.) is located in an upland area surrounded by the Zagros Mountains

with steppe vegetation (e.g., *Astragalus*, *Euphorbia*, *Zygophyllum*), about 60 km northeast of city of Kermanshah, Kermanshah province, western Iran (Fig. 2).

***Eremias montanus*, new species (Figs. 3-4)**

Holotype and type locality: An adult female, Field number P198, collected by the senior author on 14 August 1995 from the upland regions of the Zagros Mountains, 60 km northeast of city of Kermanshah (47° 5'E, 34° 52'N), Kermanshah Province, western Iran, at about 1800 m elevation

Paratypes: Two adult females, Field number P199-P200, other information as for the holotype.

Diagnosis and comparison: A small-sized lacertid, maximum snout-vent length (SVL)= 57.2mm, tail length = 95mm, with 13-14 longitudinal and 27-28 transverse rows of ventral plates, slightly converging posteriorly; with 63-67 small, granular scales across

middle of dorsum. A species belonging to the subgenus *Eremias*: subocular reaches mouth edge; one frontonasal; two supraoculars which are not completely separated from frontal and frontoparietals; distance between the femoral pores being narrow; color pattern "striped"; inhabitant of steppe and mountain-steppe landscapes (Szczerbak, 1974: 83).

On the other hand, it differs from all other species of its relevant subgenus based on having several distinguishing characters; the color pattern is distinctive and it is distinguishable from all other species in this character i. e., dorsum uniformly dark-brown without spots and ocelli, interrupted by five light longitudinal stripes; the vertebral stripe bifurcating on the nape, two paravertebrals on each side; a broad dorso-lateral stripe containing one or two regularly arranged light spots (different from the other *Eremias* species in this character); Furthermore, it differs from each species of the typical subgenus in the following character combinations (Bischoff and Bohme, 1980; Bohme and Szczerbak, 1991; Rastegar-Pouyani and Nilson, 1997; Szczerbak, 1974):

From *Eremias nigrolateralis* Rastegar-Pouyani and Nilson, 1997 in having a much smaller size, lack of separation of the third pair of submaxillary shields by granular scales (0% versus 100%), lower count of gulars (23-24 versus 41-42), variable number of submaxillary shields (33% versus 0%), reach of femoral



Figure 3. *Eremias (Eremias) montanus* holotype.



Figure 4. *Eremias (Eremias) montanus* paratypes.

pores to the knee (100% versus 0%), and distinct differences in color pattern.

From *Eremias persica* Blanford, 1874 in having a smaller size, lower count of gulars (23-24 versus 28-38), the absence of distinctly keeled upper caudal scales (100% versus 75%), variable number of submaxillary shields (33% versus 4%) and distinct differences in color pattern.

From *E. velox* (Pallas, 1771) in having a smaller size, in the absence of distinctly keeled upper caudal scales (100% versus 0%), variable number of submaxillary shields (33% versus 5%) and in color pattern.

From *E. strauchi* Kessler, 1878 in having a smaller size, the absence of distinctly keeled upper caudal scales (100% versus almost 0%), variable number of submaxillary shields (33% versus 9%) and in color pattern.

From *E. lalezharica* Moravec, 1994 in having variable number of submaxillary shields (33% versus 0%), higher count of dorsals (63-68 versus 54-59), no contact of gulars with the second pair of submaxillary shields, lack of a small scale between prefrontals, and distinct differences in color pattern.

From *E. afghanistanica* Bohme and Szczerbak, 1991 in a much higher count of dorsal scales (63-68 versus 44-46), lower count of gulars (23-24 versus 25-28), variable number of submaxillary shields (33% versus 0%), and in color pattern.

From *E. nikolskii* Bedriaga, 1905 in a higher count of dorsals (63-68 versus 45-59), variable number of submaxillary shields (33% versus 8%), and in color pattern.

From *E. regeli* Bedriaga, 1905 in a higher count of dorsals (63-68 versus 43-61), higher number of scales in the 9th-10th caudal annulus (27-28 versus 17-25), the absence of distinctly keeled upper caudal scales (100% versus 0%), variable number of submaxillary shields (33% versus 3%), and in color pattern.

Description of holotype: An adult female, preserved in 75% ethyl alcohol in good condition; body small and moderately depressed; a species of the subgenus *Eremias* (Szczerbak, 1974:83); five pairs of submaxillary shields, first three pairs in contact, the fourth and fifth pairs widely separated; first pair of submaxillary shields as large as the fifth and in contact with mental anteriorly, with first and second infralabials laterally; the fifth submaxillary pair each in contact with the fourth pair anteriorly, being surrounded by 8 granular scales laterally and posteriorly; 7-8 supralabials, 4-5 of which anterior to subocular which borders the

mouth; two large nasals in contact with rostral anteriorly, with first and second supralabials laterally, and with frontonasal and first loreal posteriorly, the former being single, broader than long and laterally in contact with first loreal and posteriorly with prefrontals; two prefrontals each smaller than frontonasal and almost as long as broad and laterally in contact with second loreal and posteriorly with frontal and granules of supraocular region; only frontonasal with distinct concavity; frontal almost as long as prefrontal and frontonasal together, broadened and posteriorly and laterally partly in contact with supraoculars (and partly separated from the latter by 2-3 large scales, not by granules) and posteriorly with frontoparietals; two frontoparietals almost as large as a single supraocular, laterally being in contact with the second supraocular, and posteriorly with interparietal and parietals, the former being small and relatively lozenge-shaped, surrounded by frontoparietals and parietals; two very large and plate-like parietals, almost as long as broad, being in contact behind interparietal; a vestigial occipital; two loreals, first one small, surrounded by first two supralabials, nasal, frontonasal, and the second loreal which is distinctly large with an evident keel; 6-6 supraciliaries, separated from supraocular by a series of 42-44 granules; postocular elongate, surrounded by granules anteriorly; temporal region mostly covered by granular scales becoming large towards the orbit, more than 100 on each side; tympanic scale distinct and elongated obliquely, almost the same size on both sides; tympanum vertically elongated, slightly larger than orbit; no distinct supratemporal; subocular huge, broader than long with a distinct ridge being extensively in contact with the lower edge of orbit; lower eyelids with a semi-translucent membrane made up of about 22 enlarged scales; collar well pronounced, not serrated, made up of 10 scales, the two medial ones the largest; gular fold weakly developed, 23-24 gulars from symphysis of chin shields to median gular, becoming enlarged posteriorly; 13-14 longitudinal and 27-28 transverse rows of almost squarish ventral plates from collar to hindlimbs; anterior series of ventrals to some extent irregular, median ventral longer than broad; dorsal scales juxtaposed, smooth, granular, becoming slightly larger posteriorly, 63-68 scales across the middle of dorsum, and about 160-164 scales in a single row from occiput to a point just above the vent; proximal caudals larger than posterior dorsals but the change being gradual; caudals becoming large, elongate, and slightly keeled distally, arranged in distinct whorls, 27-28 scales in the 10th whorl behind the vent; upper forearm covered dorsally by enlarged, juxtaposed, and almost lozenge-shaped scales; lower forearm covered

with granules; upper hindlimbs covered externally by granules, externally by large shields; tibia covered dorsally by slightly pointed granules, ventrally by large plates which are slightly keeled, two plates in a transverse row; no fringes on the toes, 18-20 uni- and bi-carinate lamellae under fourth toe, proximal part of lower fourth toe containing two complete rows of lamellae, distal part with a single row (in this character it is quite different from all other species of its relevant subgenus); 18-19 femoral pores in each side, the two series separated anteriorly by a narrow space consisting of three scales; preanal region encompassing 24 large shields, the four median ones being the largest; 6 plates in longitudinal row from the space between femoral pores to anterior edge of the vent.

Coloration and color pattern: Dorsum uniformly dark-brown without spots and ocelli, interrupted by five light, narrow longitudinal stripes: one vertebral bifurcating on the nape, two paravertebrals on each side; a broad dorso-lateral stripe containing one or two regularly arranged light spots; a ventro-lateral series of dark-brown spots, to some extent forming a stripe; upper surface of head uniformly olivish-brown; temporal and labial regions suffused by dark-brown; submaxillary region light-gray-cream; ventral region dirty white, suffused by bluish-brown; upper surface of limbs dark-brown containing numerous light spots; proximal upper surface of tail brown, distal part light brownish-gray; lower surfaces of limbs and tail yellowish-white.

Description of paratypes: The paratypes, two adult specimens, one male (P199) and one female (P200) approximate the holotype in almost all pertinent details. However, there are some minor differences between paratypes and the holotype as follows:

Male paratype: five submaxillary shields on the right side but only four on the left, the fifth vestigial; 13-14 longitudinal and 30-31 transverse ventral plates; 10-11 collars, 3-4 median ones the largest; 23-24 gulars in a longitudinal row from chin shields to collar; 20-20 femoral pores, separated by three small scales; 23-24 lamellae under fourth toe; 23-27 scales around 10th tail annulus; 8-9 labials, 5 of them anterior to subocular; 6-6 lower labials; lower nasal resting on the first two supralabials; temporal scale vestigial; 62-63 scales around widest part of dorsum; 162-167 scales in a single longitudinal row from occiput to vent.

Measurements (mm): SVL = 58.5; TL = incomplete; Forelimb = 24; Hindlimb = 39; HL = 15.5.

Female paratype: only four pairs of submaxillary shield, the fifth vestigial; 15-17 longitudinal and 31-

33 transverse rows of ventral plates; 9 collars, 4-5 median ones the largest; 24-25 gulars in a single longitudinal row from chin shields to collar; 20-20 femoral pores, separated by a space corresponding to two scales; 25-26 scales on the 10th tail annulus, 24-25 subdigital lamellae under fourth toe; 8-9 supra- and 4-6 infralabials; temporal scales relatively small; frontal separated from the first supraocular by two large scales (not by granules); 65-67 scales around widest part of dorsum; 163-167 scales in a single longitudinal row from occiput to vent.

Measurements (mm): SVL = 52.9; TL = incomplete; Forelimb = 23; Hindlimb = 35.5; HL = 13.6.

In color pattern they are quite similar to the holotype.

Habitat: During field work on the western regions of the Iranian Plateau in 1995, we surveyed the Zagros Mountains and the nearby mountain steppes in the northern parts of Kermanshah province. 60 km north-east of Kermanshah city, in the highland steppes, in vicinity of the Village of Siah-Darreh in an area named Sarpal, we came across to three specimens of a new taxon of the genus *Eremias*, described here as a new species. The habitat, which is surrounded by the Zagros Mountains, is characterized by a mountain-steppe; the vegetation is luxuriant steppe association: mainly *Astragalus*, *Euphorbia*, *Artemisia*, and *Amigdalus* as well as various species of the families Gramineaceae and Compositae (Fig. 5).

Since it is a mountainous region with relatively high elevation, the winter being harsh and cold, the summer being mild and rather short. All the specimens were foraging around the shrubs probably looking for prey. They were quite shy and wary and very difficult to capture. When alarmed, they took refuge under the shrubs or inside the underground holes. One of the most effective anti-predatory adaptations evolved in these lizards is the ability to lose the tail (autotomy) when being touched by the predators (or collectors). Hence, we could only collect one specimen with a complete tail and the other specimens lost their tails during capturing.

In September 1998, we re-surveyed the type locality in order to find more specimens of this species but without success. Whether it being a relictual and rare species, confined only to the type locality, or being distributed over a wider area in the western margin of the Iranian Plateau is yet to be established.

With regard to the occurrence of *Eremias montanus* in the highlands of Kermanshah province, the Procter record of *E. velox*, as the westernmost record, from Kuretu (Iran-Iraq border) (Procter, 1921:252) should seriously be reconsidered.



Figure 5. Habitat and type locality of *Eremias (Eremias) montanus*. 60 km northeast of Kermanshah, vicinity of Siah-Darreh village, Kermanshah Province, Western Iran.

Etymology: *Eremias montanus* is so named as it is apparently restricted in distribution to the upland and mountainous steppes of northeastern regions of Kermanshah province, western Iran.

Taxonomic account: As mentioned before, so far, the most complete work done on the complicated genus of *Eremias* (sensu lato) is of Szczerbak (1974) who studied almost all species and species complexes of this genus throughout the range. Based on morphological characters and geographic distribution, Szczerbak (1974) subdivided the inclusive genus *Eremias* (s. l.) into two distinct genera; the genus *Mesalina* as a north African and lowland southwest Asian clade, and the genus *Eremias* (sensu stricto) which is mainly occurring in Central and northeast Asia. (Szczerbak, 1974).

Furthermore, Szczerbak (1974) subdivided *Eremias* (s.s) into five distinct subgenera: *Eremias* (Szczerbak, 1974: 83), *Rhabderemias* (Szczerbak, 1974: 201), *Ommateremias* (Szczerbak, 1974: 146), *Pareremias* (Szczerbak, 1974: 22-23), and *Scapteria* (Szczerbak, 1974:247).

Except for the subgenus *Pareremias*, which is a Central and east Asian clade, all of the major species groups of the genus are presented on the Iranian Pla-

teau (Anderson, 1999). Arnold (1986) who studied the hemipenes of lacertids supported the Szczerbak's subgeneric names. In a more recent study Arnold placed *Eremias* as the sister taxon of a clade including *Acanthodactylus*, *Mesalina*, and *Ophisops-Cabrila* (Arnold, 1989:238, 240). But Mayer and Benir (1994) have proposed a different scenario. According to these authors, *Eremias* is the sister taxon of *Mesalina* and both of them belong to a larger clade also containing *Omanosaura* and *Ophisops*. They believe that *Eremias* is not closely related to *Acanthodactylus*.

The Czech Biological Expedition to Iran in 1996 collected 8 specimens of an undetermined species of *Eremias* related to *E. persica* from the Zagros Mountains in Esfahan province at about 2000-2200 m elevation (Frynta et al., 1997: 9-10). Whether it is a new taxon or just a variety of *E. persica* is yet to be known.

Material examined: *Eremias montanus* (n = 3): P 198-200 (Field number), from around the Siah-Darreh Village (about 1800 m elevation), 60 km northeast city of Kermanshah, Kermanshah province, western Iran.

Eremias nigrolateralis (n = 2): GNHM. Re. ex. 5147-5148, from 150 km northeast of Shiraz, Fars province, south-central Iran.

Eremias persica (n = 4): GNHM. Re. ex. 5159-5162, from 150 km northeast of Shiraz, Fars province, south-central Iran.

Eremias persica (n = 28): GNHM. Re. ex. 5163-5190, from 45 km east of Arak on the road to Qum, Markazi province, north-central Iran.

Eremias persica (n = 4): GNHM. Re. ex. 5191-5194, from 65 km west of Tehran, between Eshtehard-Saveh, Tehran province, northern Iran.

Eremias persica (n = 2): GNHM. Re. ex. 5195-5196, from 45 km east of Golpaygan, Esfahan province, central Iran.

Eremias persica (n = 4): GNHM. Re. ex. 5197-5200, from 50 km north of Delijan on the road to Qum, Markazi province, north-central Iran.

Eremias persica (n = 1): GNHM. Re. ex. 5201, from 50 km north of Abadeh, Fars province, south-central Iran.

Eremias persica (n = 1): GNHM. Re. ex. 5202, from 50 km east of Hamedan on the road to Qazvin, Hamedan province, western Iran.

Eremias persica (n = 3): GNHM. Re. ex. 5203-5205, from 5 km west of Takestan on the road to Zanjan, Zanjan province, northwestern Iran.

Eremias velox (n = 4): GNHM. Re. ex. 5122(1-4), from around the Carin River, 250 km E-SE Almaty (Alma Ata), Kazakhstan.

Eremias velox (n = 2): GNHM. Re. ex. 5120 (1-2), from Mulali Kurozek, eastern Kazakhstan.

Eremias velox (n = 2): GNHM. Re. ex. 5121(1-2), from the Taldi Korgau District, northeast Kazakhstan.

Eremias velox (n = 2): GNHM. GK. 18881 (1-2), from Archenjan Village (1), and 30 km north of Mary (2), Turkmenistan.

Eremias strauchi (n = 3): GNHM. Re. ex. 4411 (1-3), from Golestan National Park, Mazandaran province, northeastern Iran.

Abbreviations : GNHM. Re. ex. = Gothenburg Natural History Museum, Reptilia exotica; GNHM. GK. = Gothenburg Natural History Museum, General Catalogue.

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