

Additional specimens of *Eirenis coronelloides* (Jan, 1862) (Ophidia: Colubridae) in western Iran

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The genus *Eirenis* encompasses 20 small-sized colubrid species, showing its highest diversity with 13 species in Iran. *Eirenis coronelloides* (Jan, 1862) is one of these 13 species which found in western Iran. Two additional specimens of this species were collected in western Ilam Province, Western Iran. This taxon has a crescent-like distribution in the Middle-East with eastern ramous extended in the western and southwestern regions of Iran. Morphological analyses of the additional specimens are presented. The number of ventrals in some specimens increases geographically from west to the east. This taxon is distributed in two different geographic regions, namely the Zagros Mountains and the western foothills of the Zagros Mountains, with different climatic conditions. This species is sympatric with at least three congeners in western Iran, namely *E. collaris*, *E. persicus* and *E. punctatolineatus*.

Key words: *Eirenis coronelloides*, Ilam, Iran, sympatry, Zagros Mountains.

INTRODUCTION

The genus *Eirenis* Jan, 1863 encompasses 20 small-sized colubrid species (Uetz, 2018), referred to as dwarf racers or peace snakes (Amr & Disi, 2011) which are distributed in Asia and southeastern Europe (Sivan & Werner, 2003; Mahlow *et al.*, 2013). An accounting in different literature indicated that the genus *Eirenis* with 13 species, has its highest diversity in Iran (Latifi, 2000; Rastegar-Pouyani *et al.*, 2008; Gholamhosseini *et al.*, 2009; Rajabizadeh *et al.*, 2012; Rajabizadeh *et al.*, 2016; Rajabizadeh, 2018) while previous studies stated that the highest diversity, with 11 species, occur in Turkey (Sivan & Werner, 2003; Amr & Disi, 2011). At least 10 species of the genus *Eirenis* are common between Iran and Turkey (Uetz, 2018). The genus has been divided into four subgenera based on mitochondrial Cytb and 16s genes as follow: *Eirenis* Jan, 1863 (bearing *modestus* and *aurolineatus*), the new subgenus *Eoseirenis* (for *decemlineatus*), *Pseudocyclophis* Boettger, 1888 (for *persicus*) and *Pediophis* Fitzinger, 1843 (for all remaining taxa) (Nagy *et al.*, 2003).

Distinguishing characters of the genus include small head, eyes with round pupils, one preocular, and in most species a loreal scale, dorsal scales smooth, in 15 or 17 rows at midbody, anal and subcaudal scales divided (Leviton *et al.*, 1992; Gholamhosseini *et al.*, 2009; Mahlow *et al.*, 2013).

A review in literature indicate that 13 described species of the genus *Eirenis* Jan, 1863 have been recorded from Iran, namely *Eirenis collaris* (Ménétriés, 1832), *Eirenis coronella* (Schlegel, 1837), *Eirenis coronelloides* (Jan, 1862), *E. decemlineatus* (Duméril, Bibron & Duméril, 1854), *E. kermanensis* Rajabizadeh, Schmidler, Orlov and Soleimani, 2012, *E. medus* (Chernov, 1940), *E. modestus* (Martin,

1838), *E. nigrofasciatus* (Nikolsky, 1907), *E. occidentalis* Rajabizadeh *et al.*, 2016, *Eirenis persicus* (J. Anderson, 1872), *E. punctatolineatus* (Boettger, 1892), *Eirenis rechingeri* Eiselt, 1971 and *E. walteri* (Boettger, 1888) (Latifi, 2000; Rastegar-Pouyani *et al.*, 2008; Gholamhosseini *et al.*, 2009; Nilson & Rastegar-Pouyani, 2011; Rajabizadeh *et al.*, 2012; Kamali, 2013; Rajabizadeh *et al.*, 2016; Rajabizadeh, 2018). A study by Nilson and Rastegar-Pouyani (2011) reported the presence of *Eirenis coronelloides* in western Iran, added it to the ophiofauna of Iran based on the occurrence of two specimens of this species in Kermanshah Province, western Iran.

During this study, additional specimens of *E. coronelloides* are reported in Ilam Province, western Iran and compared with previously reported ones in morphological point of view which can extend our knowledge about this species in the easternmost limit of its distribution in the Middle-East.

MATERIAL AND METHODS

Ilam province is located in western Iran from 31° 58' to 34° 15' N and from 45° 24' to 48° 10' E (Fig. 1). More than 78% of this province is covered with forests, meadows and arid lands. Three geographic regions including the Zagros Mountains, western foothills of the Zagros Mountains, and Khuzestan plain occur in this province (Fathinia, 2007; Fathinia *et al.*, 2009a, b). The climatic condition of the province is divided into two different regimes: A) Mediterranean and B) arid and semi-arid (Fathinia, 2007; Fathinia *et al.*, 2009a).

Two additional specimens of *E. coronelloides* from Saleh-Abad region, Mehran Township, Ilam Province, western Iran at coordinates of 33° 32' N, 46° 09' E, and elevation of 700 m above sea level were collected in spring 2011 by the second author (N. F.) (Fig. 1). The specimens were deposited at RUZM (Razi University Zoological Museum) under the museum codes of RUZM-CE11.1 and RUZM-CE11.2 (Fig. 2).

To analyze the morphometric and qualitative characters of the two specimens the procedure proposed by Sivan and Werner (2003) was followed, comparing current specimens with the two previous specimens (GNM Re. ex. 6847 and GNM Re. ex. 6133, both males, Appendix I) reported by Nilson and Rastegar-Pouyani (2011).

RESULTS

Eirenis coronelloides RUZM-CE11.1 (Female); (Fig. 2a)

a) Meristic characters: Supralabials 7/7, 3rd and 4th in contact with eye; a single preocular, in contact with 3rd supralabial and prefrontal; a single postocular, in contact with 4th and 5th supralabials and parietal; temporals 1+1; nostril pierced in a complete nasal; internasals smaller than prefrontals; loreal present; 8/8 infralabials, the first pair in contact behind mental, separating it from anterior chin shield; the first four of infralabials in contact with anterior chin shield, the 4th and 5th in contact with posterior chin shield; anterior chin shields longer and wider than posterior pair; posterior chin shields separated by a scale from each other; dorsals smooth, 15 in midbody, 16 on the nape at the level of 6th ventral, 14 at level of 6th plate anterior to vent, 9 on the tail at the level of 2nd subcaudal; ventrals 154; anal divided; subcaudals 35, divided; dorsal bands 48.

b) Metric characters: SVL (snout to vent length) 206.25 mm; TL (tail length) 36.32 mm; HW (head width) 6.20 mm.

c) Qualitative characters: Chin shield index 2 (=posterior chin shields separated by one scale); Ventral stripe index 0.5 (=a few dark spots in the anterior part of the venter).

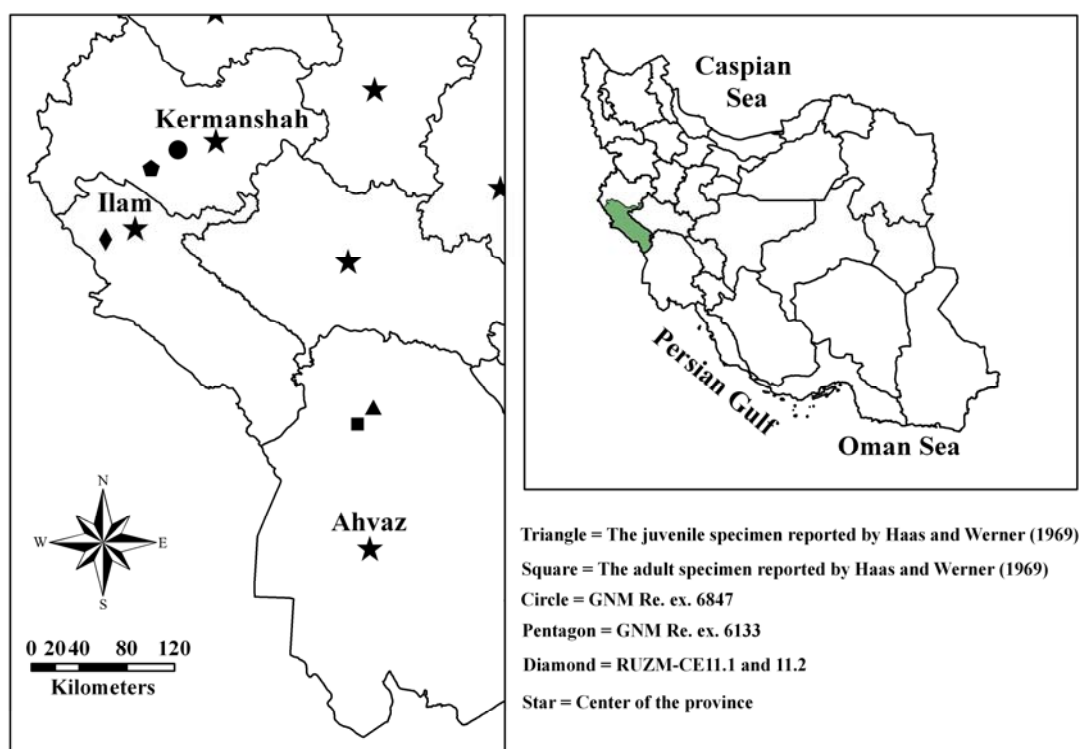


FIGURE 1. Location of Ilam province (green) in western Iran (right), and accurate and approximate localities of the specimens of *E. coronelloides* from western and southwestern Iran (left). The locality of the RUZM-CE11.1 and 11.2 is accurate while the others are approximate.

RUZM-EC11.2 (Male) (Fig. 2b)

a) Meristic characters: Supralabials 7/7, 3rd and 4th in contact with eye; preocular 1/1, in contact with 3rd supralabial and prefrontal at each side of the head; postocular 2/2, in contact with 4th and 5th supralabials and parietal; temporal 1+2; nostril pierced in a complete nasal; internasals smaller than prefrontals; loreal present; infralabials 8/8; the first pair in contact behind mental, separating it from anterior chin shield; the first four infralabials in contact with anterior chin shield, the 4th and 5th in contact with posterior chin shield; anterior pair of chin shields longer and wider than posterior pair; posterior chin shields separated from each other by a scale; dorsals smooth, 15 in midbody, 17 on the nape at the level of 6th ventral, 13 at level of 6th scale anterior to vent, 9 on the tail at the level of 2nd subcaudal; ventrals 138; anal divided; subcaudals 39, divided; dorsal bands 39.

b) Metric characters: SVL (snout to vent length) 191.19 mm; TL (tail length) 43.21 mm; HW (head width) 5.74 mm.

c) Qualitative characters: Chin shield index 2 (= posterior chin shields separated by one scale); Ventral stripe index 0.5 (= a few dark spots in the anterior part of the venter).



FIGURE 2. A female (a) and a male (b) of *E. coronelloides*, under museum codes of RUZM-CE11.1 and RUZM-CE11.2 respectively, from Ilam province western Iran.

DISCUSSION

According to the previously reported material (an adult and a juvenile specimen from southwestern Iran) by Haas and Werner (1969) which Nilson and Rastegar-Pouyani (2011) believe them as *E. coronelloides*, and the current report in Ilam Province (Fig. 1), we are now sure about the wide distribution of this taxon in western and southwestern regions of Iran.

The two specimens reported in this study show variation in scale count (ventrals, subcaudals, postocular, and temporals). In comparison to the specimens reported by Nilson and Rastegar-Pouyani (2011), our materials show greater values in the number of ventral scales but smaller values in the number of subcaudals. Of the so-far-reported specimens of this species in Iran, only one specimen is female which shows the greater ventral but smaller subcaudal numbers than male specimens (Appendix I), probably indicating sexual dimorphism which should be considered more thoroughly during future works.

Sivan and Werner (2003) have simulated the distribution of *E. coronelloides* as a partial crescent which extended through the Mediterranean climate in Jordan, Syria, Turkey and Iraq. The occurrence of this snake in western and southwestern regions of Iran may complete this crescent of distribution.

According to Sivan and Werner (2003), the number of ventrals increases geographically from west to east. The number of ventrals (154) for female specimen (RUZM-CE11.1) lies at the maximum limit of the range reported for the females (140-155) by Sivan and Werner (2003) while the number of ventrals (138) for the male specimen (RUZM-CE11.2) is more than the reported maximum limit (123-134) for the males. So this male coincides with the Sivan and Werner expression that ventral numbers increase from west to east.

Personal observations (by B. F.), as well as published data by Fathinia *et al.* (2010), confirm the presence of *Eirenis* spp. in western foothills of the Zagros Mountains, being sympatric with *E. coronelloides*. These species include *E. collaris*, *E. persicus* and *E. punctatolineatus*. The southernmost reported distribution for recently described species, *E. occidentalis*, is western Kermanshah Province in western Iran (Rajabizadeh *et al.*, 2016). Regarding the short distance of *E. coronelloides* in western Ilam to *E. occidentalis* in western Kermanshah, we suppose the sympatry of the two species in western Iran. Whether this statement is true needs further investigations in this part of Iran.

The current reported locality, Saleh-Abad region in western Ilam, is located within western foothills of the Zagros Mountains, while previously reported localities by Nilson and Rastegar-Pouyani (2011) in western Kermanshah are parts of the Zagros Mountain geographic region,

categorized by Anderson (1999). So, these two reports indicate the presence of *E. coronelloides* in two different geographic regions naturally with different climatic conditions. The questions here are, to some extent this taxon penetrates eastward into the Zagros Mountains? Where is the southern limit of its distribution in Iran? Further investigations are needed to shed more light on these ambiguities.

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Appendix 1. Some data on the previously reported specimens of *E. coronelloides* in Kermanshah Province by Nilson and Rastegar-Pouyani (GNM Re. ex. 6847 and GNM Re. ex. 6133) comparing those from Ilam province (RUZM-CE11.1 and RUZM-CE11.2). Abbreviations: GNMR (Göteborg Natural History Museum); Loc., locality; Dors., dorsals; Vent., ventrals; Subc., subcaudals; Cr., Crown.

Code	Gender	Loc.	Dors.	Vent.	Subc.	Cr.	Vent.Str.	Reference
GNM Re. ex. 6847	Male	30 Km west of Kermanshah city, Kermanshah Province	15	138	49	less distinct	0.5	Nilson & Rastegar-Pouyani, 2011
GNM Re. ex. 6133	Male	Near Islamabad in Kermanshah Province	15	132	42	less distinct	0.5	Nilson & Rastegar-Pouyani, 2011
RUZM-CE11.1	Female	Ilam Province	15	154	35	less distinct	0.5	This study
RUZM-CE11.2	Male	Ilam Province	15	138	39	less distinct	0.5	This study