

## New data on presence of the smooth snake *Coronella austriaca* Laurenti, 1768 (Serpentes: Colubridae) in Iran with notes on habitat

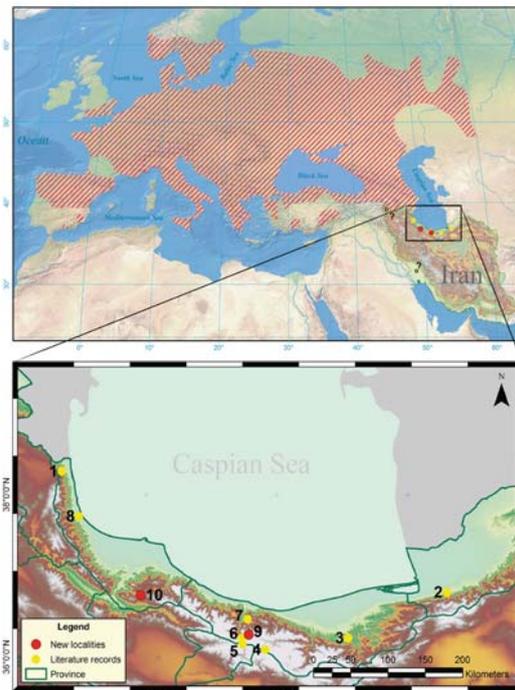
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The genus *Coronella* Laurenti, 1768 is composed of two species (Ananjeva, et al., 2006), *C. austriaca* and *C. girondica*. The herpetofauna of Iran contains *C. austriaca* and Iran is the south eastern limit of global distribution of this species.

*Coronella austriaca* Laurenti, 1768 is a slim, viviparous and medium-sized colubrid (Spellerberg, 1977; Llorente et al., 2012; Valkonen and Mappes, 2014). This species is characterized by its smooth scales of the body and round pupils (Ananjeva, et al., 2006). While the smooth snake is widely distributed across the Palaearctic (Escoriza et al., 2007; Llorente et al., 2012), it is rare in Iran.

The presence of *C. austriaca* in Iran was first reported by Strauch (Blanford, 1876). This species is one of the rarest and least known snakes in Iran, thus the knowledge of the species' distribution and habitat in this country is poorly known. Records of this diurnal, highly secretive snake in Iran is scarce and based only on few observations (Table 1, Figure 1). *C. austriaca* was previously known only from eight different localities in Iran. Nevertheless Latifi (2000) mentioned in his book, the smooth snake exists in Khuzestan and Western Azarbaijan Provinces, but there is no accurate locality or any reliable confirmation from these provinces. Herein, we provide two new punctual localities and habitat characteristics of *C. austriaca* from Gilan and Mazandaran provinces of Iran.

On 11 July 2013, at 16:45 during a field survey, we observed an active adult female. When we encountered the species, it escaped and took refuge underneath a spiny legume shrub amidst scattered stones of a grassland slope covered with *Poa*, *Festuca*, *Phleum*,



**Figure 1.** Geographic distribution of *Coronella austriaca*, indicating the previously known localities and new localities; red circles represent new localities from Iran. (Delimited area: Bannikov et al. 1977, Gasc et al. 1997 and Santos et al. 2008, Sindaco et al. 2013). For locality numbers see table 1.

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**Table 1.** Records of *Coronella austriaca* in Iran and their respective literature references.

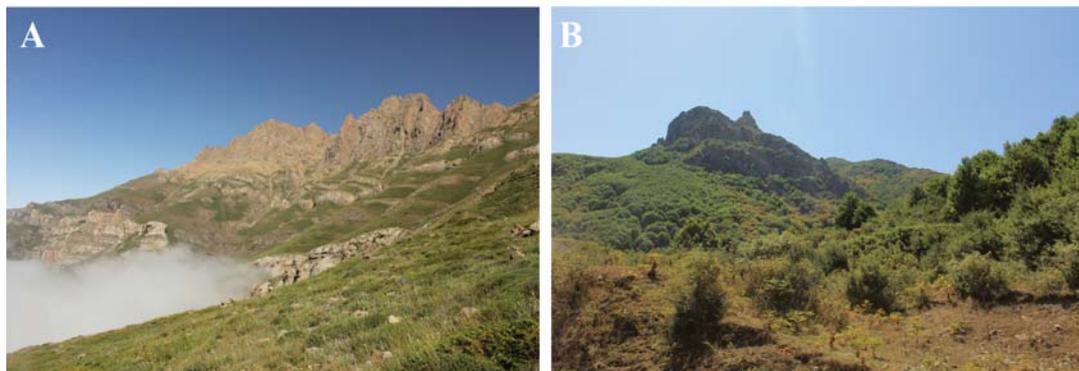
\*: shows localities without coordinate in the literature, geographic coordinate was added here based on the description.

Locality Number	Description	Geographic Coordinate	Elevation (m)	Literature Cited
1	Talesh Mountain, Gilan Province.	-	-	Blanford, 1876
2	Gorgan (Astar-abad), Golestan Province.	-	-	Nikolsky, 1903
3	Pol-e Javarem, Sorkh-kala, Mazandaran Province.	36°14'13"N, 52°54'37"E*	300	Forcart, 1950
4	Lar Damavand, North of Tehran Province.	35°57'34"N, 51°55'10"E*	-	Latifi, 1991
5	Kandavan, Northeast of Alborz Province.	36°9'38"N, 51°17'51"E*	-	Latifi, 1991
6	Vali Abad, Chalus road, Mazandaran Province.	36°14'N, 51°18'E	1800 - 2500	Frynta, et al., 1997
7	Chalus, 25km S by road, Mazandaran Province.	36°28'N, 51°22'E	800	Frynta, et al., 1997
8	Asalem, 12km W by road, Gilan Province.	37°44'N, 48°57'E	280	Frynta, et al., 1997
9	Northern central Alborz protected area, Mazandaran Province.	36°16'27"N, 51°24'06"E	2880	This work
10	Damash, Gilan Province.	36°45'46"N, 49°48'20"E	1700	This work

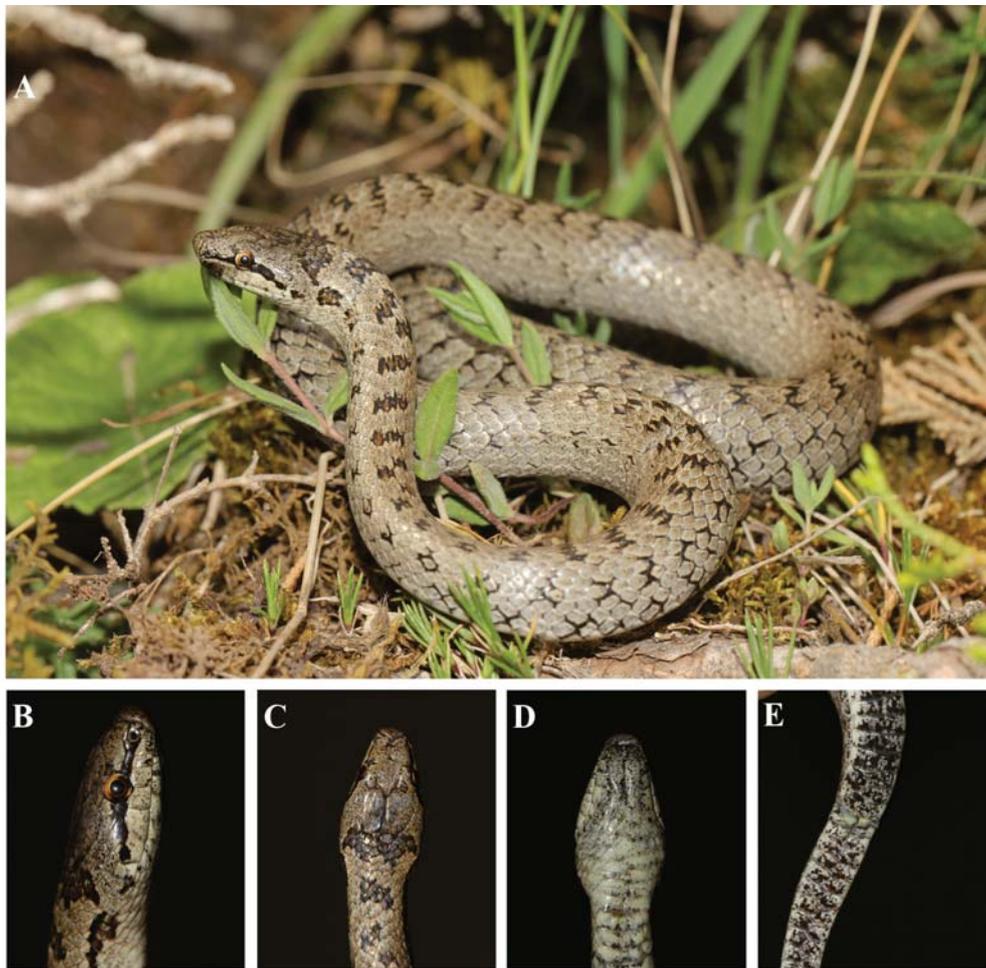
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*Elymus*, *Onobrychis* and *Koeleria* (Figure 2). This habitat is part of subalpine and alpine meadows in the northern slopes of the Alborz Mountains which are mostly covered by snow throughout winters, at 2880 m above sea level; this is the highest altitude record for this

species from Iran. We found it on Varvasht Mountain, Northern Central Alborz Protected Area, Mazandaran Province (36° 16' 27.6'' N, 51° 24' 06.8'' E). Total length (400 mm) and snout-vent length (339 mm) (Figure 3). The distance between this new record and locality



**Figure 2.** Habitat of *Coronella austriaca*, A: Northern Central Alborz Protected Area, Mazandaran Province, B: Damash, Gilan Province. Photograph by Barbod Safaei-Mahroo.



**Figure 3.** A: *Coronella austriaca* from Northern central Alborz protected area, Mazandaran Province, Iran. B: Side head view C: dorsal head view D: ventral head view E: Subcaudal view. Photograph by Barbod Safaei-Mahroo.

number six (Figure 1) is about 10 kilometers although Varvasht Mountain divided these two populations from each other. The syntopic snakes' species were *Vipera ebnieri*, *Gloydus halys* and *Hemorrhhois ravergieri*. The second record was made on 19 June 2014, at 19:05 and before dusk one female specimen of *C. austriaca* was found in the vicinity of a road. The area in which the second specimen was found is in Damash mountainous heights at 1700 m elevation in the vicinity of Soosan Chelcheragh National Natural Monument, Gilan Province. (36°45 '46.8" N, 49° 48' 20.7" E). Total length (619 mm) and snout-vent length (545 mm) (Table 2). Vegetation of the surrounding area mainly included

*Quercus macranthera*, *Acer hyrcanicum*, *Sium sisarum* and *Lilium ledebourii*. The syntopic snake species were *Natrix natrix* and *Hemorrhhois ravergieri*. Specimens were released following observations.

Frynta et al. (1997) found the smooth snake on northern slopes and in mountainous regions in Iran, in concordance with our findings. Our observations show this species is associated with Ecotonal area of Alborz Range forest steppe and Caspian Hyrcanian mixed forests. We assume because *C. austriaca* inhabiting dense forests, records of this species is low in Iran.

**Table 2.** Measurements of *Coronella austriaca* in Iran. Measurements are given in mm and abbreviated as follows: snout-vent length (SVL), tail length (TL), ventral scale (VS), subcaudal scale (SCS), dorsal scale rows (DSR), supralabial scale (SLS), infralabial scale (INS).

Locality Number	SVL	TL	VS	SCS	DSR	SLS	INS
3	333	72	178	41/41	-	-	-
4-5	440	70	168-183	44-47	19	7	7-8
9	339	61	178	41/41	19	7	8
10	545	74	178	38/38	19	7	9

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