

NOTES ON THE NATURAL HISTORY OF *Pseudocerastes urarachnoides* (SQUAMATA: VIPERIDAE)

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An Iranian viper, *Pseudocerastes urarachnoides*, was collected alive during fieldwork in April 2008. The viper was transferred to the lab where many observations were made of its biology, behavior, feeding, habitat and distribution. During this survey we verified the previous speculation that its tail ornament (knob-like structure) is used as a lure to attract prey. Distribution was extended from Kermanshah Province to Khuzestan Province.

Keywords: *Pseudocerastes*, *Pseudocerastes urarachnoides*, tail ornament, caudal luring, Squamata, Iran, Viperidae, behavior, feeding, distribution.

INTRODUCTION

Pseudocerastes urarachnoides was first described by Bostanchi et al. (2006) from Ilam and Kermanshah Provinces, western Iran. The authors speculated that its elaborate caudal ornament, which resembles an arachnid, such as a spider or solpugid was probably used in caudal luring. The paratype specimen contained a bird in its stomach and the describers suggested that the snake might be a specialized feeder. The collection of a living specimen offered the opportunity to test these speculations and to make other observations on habitat, morphology, distribution, and behavior.

The genus *Pseudocerastes* occurs across the North Arabian Desert from Sinai and southern Israel, Jordan, Iraq, southwestern Iran east to Afghanistan, and Pakistan west of the Indus River; an outlying population occurs in northern Oman (Bostanchi et al., 2006:444).

Habitat. Ilam province is located in western Iran from 31°58' to 34°15' N and from 45°24' to 48°10' E. More than 78% of the province is covered with forests, meadows and arid lands. The province is located in three

geographic regions including the Zagros Mountains, western hills of the Zagros, and Khuzestan plain (Fathinia, 2006:13).

Chakar, Bina, and Bijar, which is located from 33°22' to 33°46.08' N and from 45°48' to 46°05' E, is one of several No-Hunting Areas in Ilam province. The area of this region is almost 2% of the province area. The region is bounded to the northwest by Kermanshah province, to south and east by Mehran Township, to the northeast by Ilam Township and to the west by the Iraq border (Fig. 1).

There are two types of climate in Ilam province; (A) Mediterranean and (B) dry and semidry climate, which is found in southern and western parts of the province [climatic types IV (III) and IV₁ of Walter and Lieth (1960); see also Bobek, 1952: Fig. 6; Anderson, 1968:

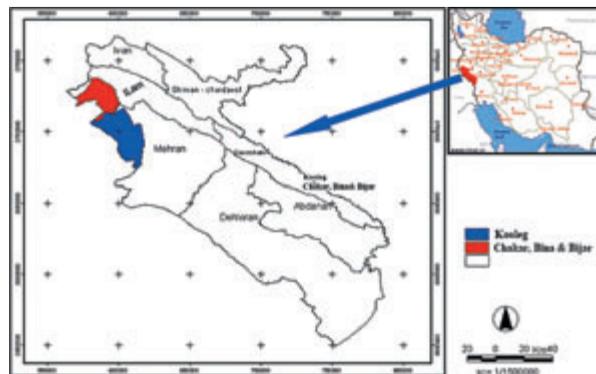


Fig. 1. Location of No-hunting Areas in Ilam Province, Iran.

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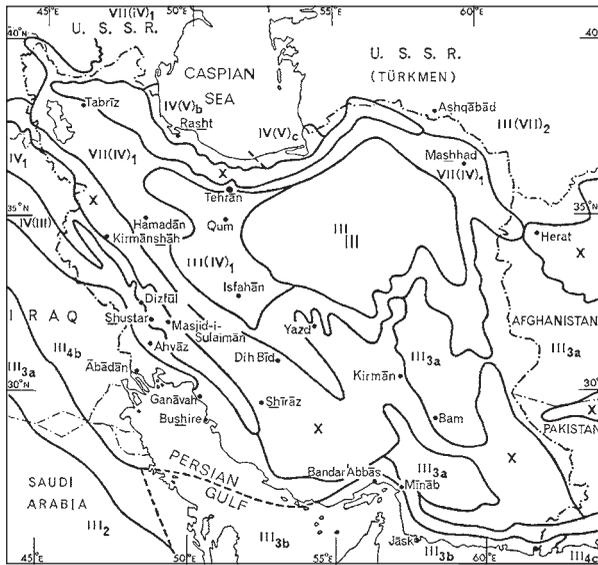


Fig. 2. Climate types of Walter and Lieth (from Anderson, 1968).

Fig. 94] and is in contrast to the desert climate in the westernmost lowland borders. The temperature of the study area is maximum in July and August (up to 50°C) and minimum in January (Rahnamaei, 1996a). (Fig. 2).

Three types of plant associations occur in this area: A) *Astragalus* – *Euphorbia*; B) *Bromus* – *Aegilops* – *Stipa*; and C) *Stipa* – *Bromus* – *Heteranthelium*. Tree and bush species also are found in this region. See Rahnamaei (1996b) for details.

Rahnamaei (1966b) and Fathinia (2006) have given accounts of the vertebrate fauna of this region.

The immediate habitat of the viper contains hill and high grounds mostly composed of gypsum. This animal prefers deep cracks and holes in the gypsum where moisture and coolness are available during warm months of summer. There are some bushes (members of *Polygonaceae* and other bushes mentioned above) near their burrows and they can lie in ambush under them in cooler hours (morning and evening hours) of the day (Fig. 3).

MATERIAL AND METHODS

During fieldwork in April 2008 in Chakar, Bina, and Bijar No-Hunting Area, two specimens of *Pseudocerastes urarachnoides* were observed. One was a juvenile that formed a coil in the cool hours of the evening (17:00) at the opening of its burrow. We tried to catch it, but it escaped into the burrow. A torch was used to investigate cracks. Torchlight shown into a crack at twilight immediately elicited a loud hissing sound. The crack



Fig. 3. Habitat of *Pseudocerastes urarachnoides* in study area.

was cleaved by crowbar and a specimen was caught by pinning its neck with a forked stick. The viper was put in a cloth bag and transported to the lab. A suitable environment similar to its natural habitat, including cracked gypsum was constructed. The viper was released in the environment and a closed circuit movie recording was set to study different aspects of its life including behavior and feeding.

RESULTS

Comments on morphology. This specimen, Razi University Zoological Museum (RUZMVP) 20.1, male, agrees with the original description in all essential characters (Table 1). Scale counts: 17 scales between horns, 20 scales around eye, 3 series of scales between eye and labials, 2 between nasal and rostral, 12 upper labials, 13 lower labials, 4 in contact with chin shields; 23 scales at midbody; ventrals 144, anal entire, subcaudals 15 pairs. Total length (TL) 840 mm, tail (T) 80 mm, TL/T = 10.5. Caudal ornament as described for holotype (Figs. 4 and 5). Anterior half of tongue is whiter and narrower than posterior half (Fig. 6). This is the first adult male specimen collected.

The scales of the viper are more prominently rugose than in any other snakes found in Iran. This feature made the viper's skin very rough. Because of the prominent scales along with more prominent appendages of the tail, local people who are familiar with it have named it *Mar-e-pardar* (= feathered snake) or *Mar-e-gatch* (= gypsum snake) (Fig. 7). The scales appear much more swollen and prominent in the living animal than in the preserved specimens illustrated by Bostanchi et al. (2006). The reason for this is that the snake inflates



Fig. 4. Ventral surface of caudal lure.



Fig. 5. Dorsal surface of caudal lure.

its body or perhaps, uses dermal muscles, causing the scales to separate and stand out from one another. Contrast the relaxed lateral scales of Fig. 8 with their appearance in Fig. 5.

Distribution. During the senior author’s recent visit to the Poisonous Animal Section of Razi Institute, Karaj, Iran, a preserved specimen of *Pseudocerastes urarachnoides* which had been collected from Khuzestan province and misidentified as *Cerastes cerastes* was seen.

TABLE 1. Counts and Measurements of All Known Museum Specimens of *Pseudocerastes urarachnoides*

Character	RUZMVP 20.1 male	FMNH 170292 female holotype	ZMGU 1300 juv. male (?)
Total length, mm	840	531	432
Tail length, mm	80	55	46
Total length/Tail	10.5	9.65	9.39
Ventrals	144	145	146
Subcaudals, number of pairs	15	15	15
Midbody scale rows	23	21	23
Scales between horns	17	Head damaged	16
Scales around eye	20	Head damaged	18/17
Scales between eye and labials, number of series	3	3	3
Scales between nasal and rostral	2	Head damaged	2
Upper labials	12	~8	11/12
Lower labials	13	13/12	13/12
Labials in contact with chin shields	4	Head damaged	3 – 5

This specimen extends the known range considerably to the south. According to the locality of the holotype (70 km SW of Ilam), paratype (25 km south of Qasr-e-Shirin), and the similarity of environments of the western borderland, which are mostly composed of gypsum sediments, we expect that this Iranian viper must be distributed from Qasr-e-Shirin to Khuzestan (Fig. 9). It should also be expected in the contiguous areas of Iraq to the northwest having similar habitat. Previous to the fieldwork, we had received from friends of Hasan Jahani a photograph of a specimen from the No-Hunting Area of Kooleg, a region just to the south of Chakar, Bina, and Bijar No-Hunting Area (Fig. 7).

Feeding. This species eats birds (perhaps not exclusively), as feathers were observed in its excrement (Figs. 10 and 11). It regurgitated remains of a lark, apparently *Galerida cristata* (Fig. 12). This is in accord with the observation of the original describers, who found a bird in the stomach of the paratype. Observations in captivity support the notion that it uses caudal luring to attract birds.

Behavior. All of the results which we discuss were observed in the lab and we can not generalize all of them to the natural habitat. When it exited alive from its burrow for the first time and was collected, it defecated twice on the collector’s arm. The viper uses both lateral and direct movements. It uses lateral movement when escaping and uses slow direct movement when coming out of its burrow. When alarmed, it gives a hissing sound and prepares to attack, raising head and neck from the ground and abruptly striking at its target without warning. Camouflage in its natural habitat is extremely effective because it perfectly resembles its environment (burned gypsum under sunlight) and one can hardly see



Fig. 6. Protruding tongue of *Pseudocerastes urarachnoides* (RUZMVP 20.1).



Fig. 8. Lateral scales of *Pseudocerastes urarachnoides* (RUZMVP 20.1) in relaxed position.



Fig. 7. Defensive posture of *Pseudocerastes urarachnoides* in Koolag No-hunting Area.

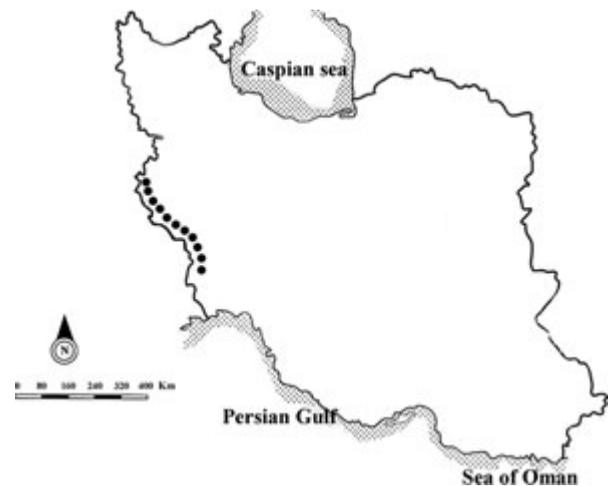


Fig. 9. Estimated distribution of *Pseudocerastes urarachnoides* in Iran.

it until it moves. Speed of the strike is very fast and Ulead® software analysis of film revealed that it can complete its strike in less than 1 sec.

We were able to observe and film the caudal luring originally suggested by the snake's describers. It was very attractive and looked exactly like a spider moving rapidly. A video of this tail movement can be seen on Anderson's web-site: <http://swasiazoology.tripod.com>. An experimental observation was planned and a chick placed in its proximity. After approximately half an hour the chick went toward the tail and pecked the knob-like structure. The viper pulled the tail structure toward itself, struck and bit the chick in less than 0.5 sec. The chick died after 1 h. In another examination a male sparrow was released in its environment, and then the viper



Fig. 10. Fecal mass of captive *Pseudocerastes urarachnoides* (RUZMVP 20.1).



Fig. 11. Dissected fecal mass showing feathers.



Fig. 12. Regurgitated bird remains.

slowly came out of its ambush, moved toward a corner and formed a coil, while putting its knob-like structure in front and contact with its mouth. Another sparrow offered to the snake was struck and it died within one minute. It is assumed that it keeps this position under bushes

in nature and lures for prey; some birds and even reptiles or small mammals, such as shrews, may be attracted toward this knob-like structure and when close enough they are struck. Many local people believe that the viper can climb into trees such as *Pistacia atlantica* and wait for prey.

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