



Original article

Survey of the reptilian fauna of the Kingdom of Saudi Arabia. VI. The snake fauna of Turaif region



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ABSTRACT

A collection of snakes in Turaif region, Kingdom of Saudi Arabia, an area that has been poorly documented for reptiles, consists of 28 specimens representing 11 species belonging to 4 families (Colubridae, Elapidae, Viperidae and Atractaspididae). This study presents the first comprehensive inventory of the herpetofauna of the Turaif province of Saudi Arabia. Co-ordinates: Latitude, longitude and altitude, of the collected specimens were mapped using GPS. Three of the snake species *Lytorhynchus diadema*, *Pseudocerastes fieldi* and *Walterinnesia morgani* reported by the authors in the present survey proved to be new records for Turaif region of Saudi Arabia.

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1. Introduction

The kingdom of Saudi Arabia is a vast and arid country covers an area of more than 2.3 million km² (Al-Sadoon, 2010). Although the desert is a harsh environment, it supports a considerable number of resident animal species, of which the reptiles constitute a major part (Al-Sadoon, 1989). Despite its historical, biological and economic significance, Saudi biodiversity in general and snake fauna in particular is poorly documented in terms of distribution and taxonomy. The herpetofauna of Saudi Arabia consists of 100 species of lizards, 55 species of snakes 10 species of turtles and 9 species of amphibians (Al-Sadoon, 2010).

The Vertebrate fauna of Saudi Arabia is an area of research for many authors. Over the past three decades many checklists of reptiles of this country have been published. Since last few decades, the number of new records increased enormously, and our knowledge about the distribution, ecology and systematics of the snakes of Saudi Arabia has improved. Extensive surveys and studies have been undertaken on the reptilian fauna of central, southern and

eastern Saudi Arabia (Arnold, 1986; Gasperetti, 1988; Al-Sadoon et al., 1991). The reptilian fauna of Southern Hejaz (Frag and Banaja, 1980), Central Arabia (Al-Wailly and Al-Uthman, 1971; Al-Sadoon, 1989), Eastern Arabia and Northeastern Arabia (Mandaviile, 1967), Riyadh region (Hussein, 1966; Al-Sadoon, 1988), Al-Zulfi area (Al-Sadoon et al., 1991) and Al-Hassa region (Al-Sadoon, 2010) have been reported. Frag and Banaja (1980) studied the herpetofauna of western Saudi Arabia. Gasperetti (1988) described the snake fauna of Saudi Arabia. Masood (2012) and Masood and Asiry (2012) studied the herpetofauna of the Asir region. Al-Shammari (2012) mentioned 16 herpetological species from the Province of Ha'il. Most recently Aloufi and Amr (2015) contributed to the herpetofauna of Tabuk province, northwest Saudi Arabia. These publications have expanded the growth of knowledge on systematics, distribution and biogeography of Saudi reptiles, and the field of herpetology in Saudi Arabia in general. However, Turaif region has a very poor representation in terms of vertebrate fauna. Very little is known about the herpetofauna of the Province of Turaif, until very recently, Al-Sadoon et al. (2016) studied the lizard fauna of this region.

The present knowledge of the snakes of Saudi Arabia is attributed to the continuous efforts of several local and foreign scientists. Turaif area is one of the richest biodiversity regions of the Kingdom, characterized by the presence of many animals belonging to different families. Recently, we reported 16 species of lizards belonging to 5 families in our survey of the lizard fauna of Turaif region (Al-Sadoon et al., 2016). Based on this recent herpetological field research conducted in this region, we herein expand this list

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of reptiles and present for the first time a comprehensive inventory checklist for the snake fauna of Turaif province. The present study is the sixth in the series of survey of the reptilian fauna of Saudi Arabia. This survey was undertaken to investigate the barely known snake fauna of Turaif region in the Northern Province of Saudi Arabia.

2. Materials and methods

2.1. Study area

The present survey was carried in Turaif region of Kingdom of Saudi Arabia. Turaif area (31°40'39"N 38°39'11"E) is located in the northern west border province of the country, close to the border with Jordan within the 10 km security strip, and approximately 26 km Southwest of the Iraq border. Different habitats like Sandy habitat, Highland habitat, Mountain habitat and Wetland habitat are found in Turaif region.

Field surveys were conducted to cover the main habitats of Turaif region during different seasons of the year (2014–2015). The most favorable time for collection was between March and July. Active ground searches were undertaken throughout the study site. Eleven species of snakes were either collected or observed during the study period. The collected specimens were deposited at College of Science, Department of Zoology, King Saud University. Snakes were identified following the keys of [Gasperetti \(1988\)](#) and based on expertise of the author. All animals were treated in accordance with the standards set forth in the guidelines for the care and use of experimental animals by the King Saud University, Riyadh; Kingdom of Saudi Arabia. Date, locality, Co-ordinates: latitude, longitude and altitude, of the collected specimens were recorded by a GPS ([Table 1](#)).

2.2. Climatological aspects

Turaif region has a continental climate, temperature ranges from 45 °C in summer to below freezing point in winter. The rela-

tive humidity ranges from 15% (July) to 71% (January), whereas, mean annual precipitation ranges from 14.3 mm (December) to 5.4 mm (March) and to 0 mm in June–July.

3. Results

[Table 1](#) shows the snake species collected or observed in different habitats of Turaif province and their co-ordinates: latitude, longitude and altitude recorded by a GPS. A total of 28 specimens belonging to 11 species of snakes were collected or observed during the study period. These 11 species belong to four families (Colubridae, Elapidae, Viperidae and Atractaspididae) with quite variable generic representation. Among the four families, Colubridae is represented by 5 genera, Elapidae by 2 genera; Viperidae represented 3 genera and Atractaspididae by 1 genera. From the standpoint of species richness within the described families of the region, family Colubridae represented 45.45% (n = 5) followed by Viperidae 27.27% (n = 3) of the total species (n = 11) collected from the studied area.

3.1. Family: Colubridae

Colubridae is the largest snake family with 304 genera and 1938 species and includes about two-third of all known living snake species. These snakes have been reported from wide range of environments and are spread in temperate and tropical regions. Some of its members are non-poisonous because they have no poison glands, and some others have weak toxicity. Twenty-six species belonging to this family have been reported in the Arabian Peninsula, however, only five were recorded in Turaif region.

3.1.1. *Psammophis schokari* (Forskål, 1775)

Two specimens of Forskal Sand Snake were collected from the study area in woodland areas such as plains and valleys. It is so-called because of the presence of light yellow lines on both sides of the body and is one of the fastest snakes reported in the Middle East, which scares a lot of people despite its weak toxicity. It

Table 1

Co-ordinates: Latitude, longitude and altitude, of the collected specimens by a GPS.

Scientific name	Status in study area	Coordinates					
<i>Psammophis schokari</i>	Rare	N 31 46.398 E 038 53.256	N 31 44.166 E 039 56.490				
<i>Malpolon moilensis</i>	Common	N 31 44.317 E 039 05.140	N 31 43.947 E 39 05.709	N 31 44.316 E 038 55.896	N 31 46.998 E 038 55.766	N 31 45.711 E 039 02.172	N 31 45.720 E 038 54.925
<i>Spalerosophis diadema cliffordi</i>	Rare	N 31 58.597 E 039 00.968	N 31 39.922 E 038 58.001				
<i>Coluber rhodorachis rhodorachis</i>	Rare	N 31 57.976 E 038 57.140	N 31 44.250 E 038 54.102				
<i>Lytorhynchus diadema</i>	Rare	N 31 45.515 E 039 04.231	N 31 44.457 E 039 03.185				
<i>Walterinnesia egyptia</i>	Common	N 31 58.458 E 039 01.918	N 31 42.954 E 039 02.424	N 31 58.603 E 038 02.102	N 31 46.231 E 038 55.925		
<i>Walterinnesia morgani</i>	Rare	N 31 58.603 E 038 02.102	N 31 58.603 E 038 02.102				
<i>Cerastes c. gasperetti</i>	Rare	N 31 44.408 E 039 05.185	N 31 43.988 E 039 01.743	N 31 43.166 E 039 02.490	N 31 58.120 E 039 01.530		
<i>Echis coloratus</i>	Rare	N 31 47.029 E 038 54.795	N 31 46.780 E 038 52.198				
<i>Pseudocerastes fieldi</i>	Rare	N 31 44.908 E 038 55.766					
<i>Atractaspis microlepidota engaddensis</i>	Rare	N 31 45.277 E 039 00.990					

has a thin cylindrical body with variable coloration and patterning and an elongated small head, featuring large golden-brown eyes with rounded pupils. The overall color of the animal is green dusty with olive background dorsally. The length of the snake was recorded around 150 cm and SVL ranged from 42 to 45 cm.

In Saudi Arabia, it has been reported from Dhahran, Al-Qatif, Hail, Afif, Jeddah, Jizan, Wadi Fatima, Riyadh, Al-Hasa (Al-Sadoon, 2010).

3.1.2. *Malpolon moilensis* (Reuss, 1834)

Six specimens of Moila snake were collected from the study area. This species live in sandy desert environments, grassy plains preferably woodland areas such as valleys where prey is available. It is also called hooded malpolon due to its unusual cobra-like behaviour, raising head at 45° angle, dilates the neck into a hood, and hisses. The body is thick and long. The head is elongated and clearly distinct from the neck, with a convex forehead and a pointed snout, which protrudes over the mouth. The fangs lie posteriorly in the jaw. The coloration is yellowish to sandy gray, with small dark brown patches on the back and black spots behind the eyes. The ventral side is creamy or whitish. The length ranged from 80 to 145 cm.

Records of this species are widely scattered throughout Saudi Arabia including Abqaiq, Dhahran, Jeddah, Tuwal, Jabrin, Riyadh, Al-Zulfi, Al-Kharj, Al-Hasa (Al-Sadoon, 2010)

3.1.3. *Spalerosophis diadema cliffordi* (Schlegel, 1837)

Two specimens of this non-venomous diadem snake were collected from the study area in open areas (valleys and agricultural areas). The body is thick and long, characterized by dark gray-color with large dark spots on the dorsal side. The ventral side is white. The head is flattened, eyes with pale irises and round pupils. These were large sized snakes (length 105 cm).

Widely distributed throughout the Arabian Peninsula and reported from the central, western and eastern regions (Al-Sadoon, 2010).

3.1.4. *Coluber rhodorachis rhodorachis* (Jan, 1865)

Two specimens of this Braid snake were collected from the study area in rocky areas. It is relatively a long, cylindrical and fast moving snake; ranged in length up to 120 cm. the color was generally pinkish dorsally with dark bands. The ventral side is pale white in color. The narrow head is blackish gray with black stripes on the sides. This species is also a non-venomous snake.

In Saudi Arabia it has been reported from Buryman, Jeddah, Abha, Riyadh, Al-Kharaj, Al-Dirriyah and Wadi As-Sirrah (Al-Sadoon, 1989).

3.1.5. *Lytorhynchus diadema* (Dumeril, Bibron & Dumeril, 1854)

This snake also known as awl-headed snake or crowned leaf-nosed snake is widely spread throughout the Arabian Peninsula but only two specimens of this nocturnal sand snake were collected from the study area in sandy places near gravel patches. The snake reaches up to the length of 80 cm. This snake is characterized by a shovel-shaped or leaf-like projecting snout. The dorsal color is very similar to the color of sand with 13–18 brown spots. Ventral side is white. The eyes are large and rounded. The body is slender and rounded in section. It is harmless.

In Saudi Arabia it has been reported from Dhahran, Abqaiq, Jeddah, Ras As-Shara, Al-Qahmah, Halaban, Al-Khubara, Al-Qurayn, Zaymah, Hadda, Shagra, Al-Riyadh, Al-Zulfi and Al-Hasa (Al-Sadoon, 1989, 2010)

3.2. Family: Elapidae

Members of this family are big sized up to a meter in length, with large head and long tail. They have cylindrical bodies covered with small overlapping dorsal scales, and at the ventral side the scales are large and broad. They have small tusks on the upper jaw and are neurotoxic. Two species belonging to this family have been reported in the Kingdom: the Arabian cobra (*Naja haje arabica*), inhabiting the south-western region and the black cobra (*Walterinnesia aegyptia*) reported from central, northern and eastern regions. However, *Walterinnesia morgani* was recorded for the first time. Two species belonging to this family were recorded in Turaif region.

3.2.1. *Walterinnesia aegyptia* (Lataste, 1887)

Four specimens of this species were collected from the study area in open desert environments. Desert Cobra is characterized by its black color. The length of the snake was recorded around 120–135 cm. Head is broad with thick body. It is considered one of the most dangerous snakes in terms of the degree of toxicity (neurotoxic) characterized by rigid, grooved fangs at the front of the upper jaw.

This snake spreads in many parts of Saudi Arabia and has previously been reported from Riyadh, Wadi Qatan, Ain Dar, Al-Mishaab, Rumah, Khurais, Tumair, Ammariyah and Al-Hasa (Al-Sadoon, 2010).

3.2.2. *Walterinnesia morgani* (Mocquard, 1905)

Walterinnesia morgani is a venomous elapid snake, also known as the Black Desert Cobra. Its distribution in Arabia is restricted to Northeastern Saudi Arabia. Two species were collected from the study area. It has been considered as a synonym of *Walterinnesia aegyptia* until recently.

3.3. Family: Viperidae

Members of this family are poisonous and characterized by triangle shaped heads. Their thick and short bodies have clear necks and short tails with small overlapping dorsal scales. They have front needle shaped tusks on the sides of the upper jaw and are hemotoxic. Three species belonging to this family were recorded in Turaif region.

3.3.1. *Cerastes cerastes* Gasperetti (Leviton & Anderson, 1967)

Four specimens of this Arabian Horned Viper were collected from the study area inhabiting sandy environments. It is so-called because of the presence of scales like horns at the top of the head. It has thick body with broad and subtriangular head. The tail is relatively short covered with keeled scales, and the adults ranged from 55 to 85 cm in length. The color varies from red to brown, matching the color of the habitat where they live. The ventral side is white or yellowish. Arabian horned viper is considered as highly venomous snake, upper jaw containing a pair of tubular canines connected with the poison gland located on the side of the head.

In Saudi Arabia it has been reported from Jizan, Ummlaj, Bishah, Dharan, mahd Al-Dhahab, Central region and Al-Hasa (Al-Sadoon, 2010).

3.3.2. *Echis coloratus* (Gunther, 1878)

Two specimens of this carpet viper were collected from the study area inhabiting rocky and sandy regions. The adult of this snake ranged 60–75 cm in length. The body is stocky, short with large and wide head. This carpet viper is usually gray or brownish in color. A series of dark-edged pale dorsal cross-bands runs along

the back. It is aggressive and considered one of the most dangerous venomous snakes in Saudi Arabia.

In Saudi Arabia it has been reported from Ummluj, Yanbu, Jeddah, Jabal, Shar, central region and Al-Hasa region (Al-Sadoon, 2010).

3.3.3. *Pseudocerastes fieldi* (Schmidt, 1930)

A single specimen of this snake was collected from the study area inhabiting limestone deserts. Their head is triangular, wide and very distinct from neck. They have short and rounded snout. This snake has a shorter tail. There are erect horn-like projections formed of several small imbricate scales and its tip ending by two tiny scales. The length of this snake was 90 cm. The color blends with the lava desert. Like other vipers, this viper is venomous and possesses a pair of long, hollow fangs. Earlier, this snake has been reported from Tubaiq Protected Area, Saudi Arabia. However, this is the first report of *P. fieldi* reported from Turaif region of the country.

3.4. Family: Atractaspididae

Members of this family are characterized by strong hollow needle shaped tusks having the ability to move in all directions. They are highly poisonous snakes. They are globally widespread. One species was recorded in Turaif region.

3.4.1. *Atractaspis microlepidota engaddensis* (Hass, 1950)

A single specimen of this burrowing snake was observed in the study area. The head is flattened, spade-shaped and distinct from the body and neck. They have tiny eyes and no visible neck with small spike on end of the tail. Its body is dark black in color. It has a pair of long fangs, occasionally have sideways motion.

In Saudi Arabia it has been reported from the central and western region (Al-Sadoon, 1989, 2010).

4. Discussion

The reptilian fauna of Kingdom of Saudi Arabia is highly heterogeneous and diversified. Snakes occupy specific habitats within the different ecozones of Saudi Arabia, which suit their environmental requirements. Snake fauna has been studied in different regions of Saudi Arabia (Al-Sadoon, 1989, 2010; Masood, 2012; Masood and Asiry, 2012; Aloufi and Amr, 2015), however, the snakes inhabiting Turaif region of this country was not studied till date.

The data presented in the present survey is confirmed by reports of several authors like Farag and Banaja (1980), Al-Sadoon (1989, 2010), Wilms and Bohme (2007), Masood (2012), Masood and Asiry (2012) and Aloufi and Amr (2015). Survey carried out by Al-Sadoon (1989) in Central region and Al-Sadoon (2010) in Al-Hasa region of Saudi Arabia confirmed our reports of the presence of various species like, *C.c. gasperettii*, *E. coloratus*, *W. aegyptia*, *A. microlepidota engaddeensis*, *M. moilensis*, *P. schokari*, *S. diadema cliffordi*, *L. diadema*. Aloufi and Amr (2015) observed similar species (*P. schokari*, *S. diadema cliffordi*, *C. gasperettii*, *E. coloratus* and *W. aegyptia*) during their survey carried in Tabuk province of Saudi Arabia. However, in the present study, three snake species (*L. diadema*, *P. fieldi* and *W. morgana*) reported by the author proved to be new records for Turaif region.

This study presents the first comprehensive inventory of the herpetofauna of the Turaif province of Saudi Arabia. As per our sur-

vey, 11 species of snakes belonging to four families (Colubridae, Elapidae, Viperidae and Atractaspididae) were recorded during the study period. The distribution of these species differs in terms of habitat and abundance. In terms of species abundance, the most abundant family recorded in the present survey was Colubridae with 5 species followed by family Viperidae represented by 3 species. However, 8 and 6 species of snakes belonging to the family Colubridae and 2 and 3 species of snakes belonging to family Viperidae were recorded in Central region and Al-Hasa region of Saudi Arabia by Al-Sadoon (1988, 2010), respectively.

The highlight of this survey was the first record of three species of snakes namely *L. diadema*, *P. fieldi* and *W. morgana* in the Turaif region of Saudi Arabia. In conclusion, since this is the first herpetofaunal inventory list for the Turaif region of Saudi Arabia, it can be expected that further intensive surveys, other sampling seasons and different sampling areas will yield more data, and thus increase the number of records of species occurring in the Turaif province.

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