

## THE LIZARD FAUNA OF AL-NAJAF PROVINCE, SOUTHERN IRAQ

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Received: 01.02.2015; Accepted: 06.06.2015

**Abstract.** The AL-Najaf Province in Iraq possesses varied climatic and geographical conditions leading to a rich biodiversity. An investigation on the status of lizards in this Province was carried out from September 2013 to May 2014. A total of 116 specimens were collected and identified. The collected specimens represented six families, eight genera, and 11 species and subspecies, including: Agamidae: *Phrynocephalus maculatus maculatus*, *Trapelus ruderatus ruderatus*, Gekkonidae: *Cyrtopodion scabrum*, *Hemidactylus flaviviridis*, *Hemidactylus turcicus* and *Hemidactylus persicus*; Lacertidae: *Ophisops elegans elegans*; Scincidae: *Trachylepis aurata septemtaeniata* and *Trachylepis vittata*; Uromastixidae: *Uromastix aegyptius* and Varanidae: *Varanus griseus griseus*.

**Keywords:** Fauna, Lizard, AL-Najaf, Bahr Al-Najaf, AL-Kufa, Iraq

### 1. INTRODUCTION

The geography of Iraq is diverse and falls into four main regions: The desert (west of the Euphrates), Upper Mesopotamia (between the upper Tigris and Euphrates rivers), the northern highlands of Iraqi Kurdistan, and the Lower Mesopotamia, the alluvial plain extending from around Tikrit to the Persian Gulf. This wide range of habitats, such as forests, meadows and deserts, provide ecological niches of diversity.

Bahr Al-Najaf is a wet land depression area located to the west and south-west of AL-Najaf City (Plate 1). It extends at northwest-southeast direction of an area about 360 -750 Km<sup>2</sup>, of coordinates 43° 40' - 44° 25' E and 31° 40' - 32° 10' N (Al-Atia, 2006). It is composed of a lake or marsh-like area with limited cultivated orchards beyond and surrounded by vast desert or semi desert areas. The area is classified as a part of the Arabian Desert and East Saharo-Arabian Xeric Shrub lands ecoregion (Bachmann et al., 2011). This multiple system complex contributes to the enriching of the biodiversity elements.

AL-Kufa is a city located on the banks of the Euphrates River about 170 km (110 mi) south of Baghdad and 10 km (6.2mi) northeast of AL-Najaf (44° 23' 58.2" E and 32° 3' 18 " N) and with elevation of about 27 m.

The Iraqi herpetofauna have been surveyed by some workers (Khalaf, 1959 Anderson, 1966, 1999; Tuck, 1971, 1974; Leviton et al., 1992). So far, about 140 taxa of lizards have been reported from Iraq. Due to its geographical and perhaps political situation this region has mostly been neglected from the standpoint of wildlife studies. Consequently, regarding the scanty of information on lizard fauna of AL-Najaf Province, present study is aimed to investigate this aspect from morphological, habitat, and distribution viewpoints.

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## 2. MATERIAL AND METHODS

Lizards were collected from two localities in Al- Najaf Province: Bahr AL-Najaf and AL-Kufa city, from 19<sup>th</sup> September 2013 to 12<sup>th</sup> May 2014. The locality data and habitat features were recorded for all the studied species. Most specimens were fixed by injection of 96% ethanol, tagged, fixed, took photos and then preserved in 70% ethanol, the voucher specimens are deposited in the Razi University Zoological Museum (RUZM) in Kermanshah. Specimens were identified according to Khalaf (1959), Anderson (1999), Rastegar-Pouyani et al. (2006, 2008) and Leviton et al. (1992) using morphometric measurements, coloration, and pholidotic features (including number, structure, and range of scales and shields).

**Statistical Analysis** – The data were analyzed statistically using SPSS version 14.0 and the maximum, minimum and mean values were measured for all the specimens.

## 3. RESULTS

A total of 116 specimens were collected in the study area including 11 species and subspecies belonging to eight genera and six families (Tables 1-2). The distribution map of the studied species and their relevant photos are presented in Plates 1-4.

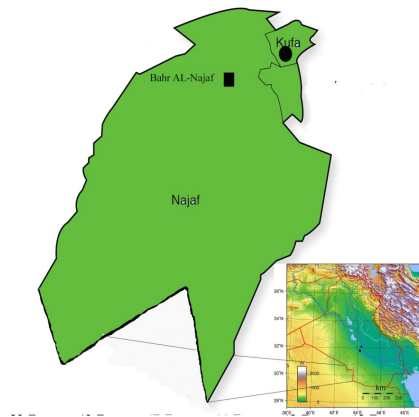
**Table 1.** List of the Families, Genera, Species and subspecies of studied lizards.

Family	Genera and Species
Agamidae	<i>Phrynocephalus maculatus</i> <i>Trapelus ruderatus ruderatus</i>
Lacertidae	<i>Ophisops elegans elegans</i>
Scincidae	<i>Trachylepis vittata</i> <i>Trachylepis aurata septemtaeniata</i>
Gekkonidae	<i>Hemidactylus persicus</i> <i>Hemidactylus turcicus</i> <i>Hemidactylus flaviviridis</i> <i>Cyrtopodion scabrum</i>
Uromasticydae	<i>Uromastyx aegyptius</i>
Varanidae	<i>Varanus griseus griseus</i>

**Table 2.** Summary of stations and species occurrences.

Locality	Varanidae	Gekkonidae				Lacertidae	Scincidae		Agamidae		Uromasticydae
	<i>V.g.g.</i>	<i>H.f.</i>	<i>H.p.</i>	<i>H.t.</i>	<i>C.s.</i>	<i>O. e. e.</i>	<i>T.v.</i>	<i>T. a. sep.</i>	<i>T. r. r.</i>	<i>P. m. m.</i>	<i>U. a.</i>
<b>Al- Najaf</b>											
Bahr AL-Najaf	2					9	1	2	40	2	31
AL-Kufa		2	1	1	15	5		5			

*V.g.g.* : *Varanus griseus* ; *Hp*: *Hemidactylus persicus*; *H.f.*: *Hemidactylus flaviviridis*; *H.t.*: *Hemidactylus tersicus*; *C.s.* : *Cyrtopodion scabrum*; *O.e.e.* : *Ophisops elegans elegans* ;*T.v.*: *Trachylepis vittata* ; *T.a.sep.*: *Trachylepis aurata septemtaeniata* ; *T.r.r.*: *Trapelus ruderatus ruderatus*; *P.m.m.* : *Phrynocephalus maculatus maculatus* ;*U.a.*:*Uromastyx aegyptius*



**PLATE 1.** Map of Iraq and the localities in AL-Najaf Province where the specimens of this study were collected (Bahr AL-Najaf & AL-Kufa city).



**PLATE 2.** Bahr AL-Najaf habitat in AL-Najaf Province Southern Iraq (A), *Phrynocephalus maculatus maculatus* (B), *Trapelus ruderatus ruderatus* (C) and *Hemidactylus flaviviridis* (D).



**PLATE 3.** *Hemidactylus turcicus* (E), *Hemidactylus persicus* (F), *Trachylepis aurata septemtaeniata* (G) and *Trachylepis vittata* (H).



PLATE 4. *Uromastix aegyptius* (I) and *Varanus griseus griseus* (J)

## TAXA ACCOUNTS

### I-Family Agamidae

#### 1- *Phrynocephalus maculatus maculatus* Anderson, 1872. Black-tailed toad agamas

This species is widely distributed in the study area (Plate 2-A). Two adult specimens were collected in May 2014 at an elevation of 35 m. Their habitat is sandy flats with low, scattered shrubs surrounded by vast desert or semi desert areas with simple relives of low hills (Al-Atia, 2006). The area is characterized by the presence of plants such as: *Amaranthus blitoides*, *Albizia mara*, *Alhagi maurorum*, *Astagulus spionsus* and *Juncus arabicus*. Snout-Vent Length (SVL) of an adult male and female measured 63.71 mm and 60.85 mm, respectively. Plate (2- B) shows an adult male of *Phrynocephalus m. maculates*. This species has been listed for Iraq by Smith (1935:234), Khalaf (1959:21), and Wermuth (1967:84).

#### 2- *Trapelus ruderatus ruderatus* (Blanford, 1881)

*Trapelus r. ruderatus*, (the formerly *T. persicus*, see Rastegar-Pouyani, 2000), is widely distribution in Bahr AL-Najaf. 40 specimens were collected at the elevation 14 - 35 m. Almost all of the collected specimens were found in sandy areas, active on the surface of dunes; most numerous on the fringes of dunes near low shrubs, flat alluvial plains, where one was seen sitting on a small stone. In heavily grazed areas devoid of shrubby vegetation it is associated with small boulders and rock piles, such as those used to mark boundaries of wheat fields and gravel piles used in road construction and maintenance. When threatened, it ran to one of many scattered small, thorny, green shrubs and xerophytic plants. The measurements of maximum, minimum and mean of the SVL and TL of males and females are (105.5 mm, 72.0 mm and 90.0 ; 170.0 mm, 103.7 mm and 139.0 mm for males and 81.2mm, 65.8mm and 72.7 mm ; 125.8 mm, 99.8 mm and 111.5 mm for females respectively) (Plate 2-C).

## II- Family Gekkonidae

### 1- *Hemidactylus flaviviridis* Ruppel, 1840. Yellow –bellied house gecko.

Two adult females were collected in AL-Kufa city at the elevation of 27 m. Apparently this species is strictly a house gecko in Iraq, found on both outside and inside walls and ceilings of inhabited and abandoned buildings. The mean snout-vent length and tail length is 62.195 mm and 68.7 mm respectively (Plate 2-D).

### 2- *Hemidactylus turcicus* (Linnaeus, 1758). Mediterranean gecko, Turkish warty gecko.

A single male specimen was collected in September 2013 in AL-Kufa city. This small species is found on walls and ceilings in both inhabited and abandoned buildings. The snout vent length (SVL) of adult male is 32.42 mm, tail is broken, and its body covered with 15 longitudinal rows of warts of which some are white and the others blackish. Coloration is pinkish brown, light brown, sandy gray or sandy yellow dorsally; an indistinct dark streak from nostril to temporal region (Plate 3-E).

### 3- *Hemidactylus persicus* Anderson, 1872. Persian gecko.

One female of *Hemidactylus persicus* only, was collected in one locality in AL-Kufa. One specimen was collected in September 2013 at an elevation about 27 m. *Hemidactylus persicus* was collected at night during the period when the rocky hills are almost completely denuded of vegetation and the seasonal streams long since dry, although some water remains in sinkholes and small caverns in gypsum formations. The SVL of an adult female is about 64.12 mm and TL is 55.92 mm, (Plate 3-F).

### 4- *Cyrtopodion scabrum* (Heyden, 1827). Keeled gecko, rough scaled gecko.

*Cyrtopodion scabrum* is widely distributed in AL-Kufa city. Fifteen adult specimens were collected in September 2013 at an elevation about 18 m. They were found on both inside and outside walls of inhabited and abandoned buildings and gardens. They occurred in the same building with *Hemidactylus turcicus* on the outdoor and indoor surfaces of both urban and rural houses as well as under bridges. Dorsal coloration is sandy gray with regular longitudinally arranged spots; The maximum, minimum and mean values of the SVL and TL of an adult male and female are (46.8 mm , 39.5 mm and 43.2 mm; 68.2 mm, 49.0 mm and 56.7 mm for the male; 44.5 mm, 26.4 mm and 36.7 mm ; 55.6 mm , 37.8 mm and 45.0 mm for female respectively).

## III- Family Lacertidae

### *Ophisops elegans elegans* Mentetries. Snake-eyed lizard

*Ophisops e. elegans* has a wide distribution range throughout Bahr AL-Najaf region at lowland areas with an elevation of 14 to 27 m and AL-Kufa city at the elevation of 18-25m. Fourteen adult specimens were collected common on stony plains and hillsides; it does not occur in sandy desert regions, and is rarely found on silty plains .Vegetation varied from nearly barren areas to cultivated and fallow fields, overgrazed steppes, and open areas in riparian woodland. The dorsal coloration is olive brown with two light dorsolateral stripes. The maximum, minimum and mean values of the SVL and TL for males are (47.8 mm, 38.5 mm, and 45.2 mm; 107.5 mm, 36.2 mm, and 73.4 mm respectively), and for females are (48.2 mm, 40.4 mm and 43.8 mm; 54.6 mm, 36.3 mm and 45.4 mm respectively).

## VI- Family Scincidae:

### 1- *Trachylepis vittata* (Olivier, 1804). Bridled skink.

One male specimen was collected in Bahr AL-Najaf at an elevation of 35m, nearly devoid of vegetation near the palm growth. In some areas it occurred as sympatric with *Trachylepis aurata*, but the microhabitats did not overlap. The later preferring rocks and crevices. Prefrontals usually not in contact; parietals usually in contact behind interparietal; a distinct, light, dark-margined, vertebral stripe usually present. The SVL is 83.14 mm; tail length (TL) 115.98 mm (Plate 3G)

**2- *Trachylepis aurata septemtaeniata* (Reuss, 1834) Southern grass skink.**

Seven adults (four males and three females) were collected from both regions of the study area, in Bahr AL-Najaf at an elevation of 35 m it occurred as sympatric with *Trachylepis vittata*, and in AL-Kufa city it was found at an elevation of about 27 m. On the head region, the interparietal usually entirely separates the parietals. Ear opening rather small, with two or three minute lobules anteriorly. Color brownish; two bands lighter than the ground color extend along each side (Khalaf, 1959:44). This species inhabits lowland Iraq such areas of the foothill region where rock crevices provide a retreat (Anderson, 1963: 464). Also it occurs in grassy areas near water. The maximum, minimum and mean of snout vent and tail length for males are (75.6 mm, 68.6 mm and 72.3 mm; 99.7 mm, 73.5 mm and 83.2 mm respectively), and for females are (70.4 mm, 65.0 mm and 67.8 mm; 89.9 mm, 80.0 mm and 84.9 mm respectively) (Plate 3H).

**V-Family Uromastycidae**

***Uromastix aegyptius* Forscal, 1775.** Egyptian spiny-tailed lizard (the Arabic common name is thub).

Thirty adults and one juvenile specimen were collected in May 2014. This species is widely distributed throughout Bahr AL-Najaf at the elevation of 18-47-m. Whorls of spinous scales on upper surface of tail not separated by small scales. It digs burrows to a depth of over a meter in hard-packed sand, so that the study areas bear huge numbers of holes old and new ones (Plate 4-I). The maximum, minimum and mean of snout vent and tail length for males (in millimeter) are 360.0, 250.0, and 300.7; 270.0, 175 and 222 respectively), and for females are 370, 310 and 340; 260, 230 and 245 cm respectively).

**VI- Family Varanidae**

***Varanus griseus griseus* Daudin, 1803.** Desert monitor (The Arabic common name is “harwal”).

Two male specimens were collected, the first one was collected on 25<sup>th</sup> September 2013, and the second was collected on 9<sup>th</sup> May 2014. Both of the collected specimens were collected from Bahr AL-Najaf at the elevation of 19 m and 25 m respectively.

The habitat is characterized by harsh desert areas. This lizard inhabits some of the most hostile regions of earth, experiencing blistering heat in the summer and extreme cold in the winter. Tail roundish (circular) in cross section throughout its length and with 20 dark crossbars. The mean SVL is 410.0 mm; mean TL is 455 mm (Plate 4-J).

**4. DISCUSSION**

The current study recorded 11 species and subspecies of lizards belonging to eight genera and six families of Agamidae, Gekkonidae, Lacertidae, Scincidae, Uromasticydae and Varanidae.

The genus *Phrynocephalus* (Agamidae) is represented only by one species in Iraq, *P. maculatus maculatus* which is found in Bahr AL-Najaf (044° 15' 56.5"E and 31° 52' 57.9" N at elevation of 35 m) in AL-Najaf Province. It is listed for Iraq by Smith (1935:234), Khalaf (1959:21), and Wermuth (1967:84), but Leviton et al. (1992: 17) found neither museum specimens nor published records for Iraq or Kuwait.

A single species of *Trapelus* (Agamidae): *T. r. ruderatus* was found in Bahr AL-Najaf (044° 15' 47.2" -044° 16' 09.3" E and 31° 52' 30.5" – 31° 53' 59.6" N at elevation of 14- 35 m) Almost all of the specimens we collected were found in sandy areas (Plate, 2-A), active on the surface of dunes, most numerous on the fringes of dunes near low shrubs, flat alluvial plain, where one was seen sitting on a small rock. This lizard inhabits scattered small, thorny, green shrubs in Iraq, Kuwait, Jordan, northern Saudi Arabia, and the Ahvaz Plain in southwestern Iran (Anderson (1966:104). Despite of extensive field work in the studied area, no record of *Trapelus agilis* was found. Since the Olivier's original record in 1807, there has been no record of the occurrence of *T. agilis* within the Iraqi territory. This is the main clue for Rastegar-Pouyani (2005) to exclude Iraq from the range of *T. agilis* and to designate a new type locality for this taxon. All the Arabian records of *Trapelus agilis* appear to be misidentifications of the closely related *T. flavimaculatus* or *T. jayakari*. Further, neither Mohammad *et.al.* (2013: 21-30) nor Khalaf (1959) could record the occurrence of *T. agilis* in Iraq.

From the family Scincidae, *Trachylepis vittata* was collected in Bahr AL-Najaf at geographical coordinates 044° 16' 09.3" E, 31° 31' 53.6" N at an elevation of 35m, nearly devoid of vegetation near the palm growth. In some areas it occurred as sympatric with *Trachylepis aurata septemtaeniata*, but the microhabitats did not overlap, the later preferring rocks and crevices. *Trachylepis aurata septemtaeniata* was also found in another locality, in AL-Kufa city (32° 3' 18" N, 044° 23' 58.2" E, at an elevation of 27 m). The lizard family Scincidae (skinks), as one of the largest families of squamate reptiles, is thought to have originated in Africa and then diversified and spread through Asia and Australia to its current worldwide distribution (Anderson, 1999). The family Scincidae currently contains more than 1,300 species grouped in over 85 genera. About 100 species of these were assigned to the genus *Trachylepis* (Rastegar-Pouyani, 2006). *Trachylepis aurata septemtaeniata* differs from *T. vittata* in having smooth nuchals; parietals not in contact, separated by interparietal; postnuchals smooth or weakly keeled; no light vertebral stripe (Khalaf,1959; Leviton *et al.* 1992; Anderson 1999)

From the Family Lacertidae, the snake-eyed lizard, *Ophisops elegans elegans*, was collected on stony plains and hillsides, from both Bahr AL-Najaf at geographical coordinates 044° 20' 05.4" E, 31° 54' 06.0" at the elevation of 14 m and from AL-Kufa city 044° 23' 58.2" E, 32° 3' 18" N at 27 m. It does not occur in sandy desert regions, and is rarely found on silty plains. Vegetation varied from nearly barren areas to cultivated and fallow fields, overgrazed steppes, and open areas in riparian woodland (Leviton *et al.*, 1992: 63).

From the Family Gekkonidae, three species of the genus *Hemidactylus* Oken, 1817 were collected only at night during the period when the rocky hills are almost completely denuded of vegetation and the seasonal streams long since dry.

The gecko genus *Hemidactylus* Oken, 1817 is widely distributed in the warmer regions of the world and is one of the largest in the Gekkota, comprising approximately 111 recognized species (Uetz, 2012), with more than 23 new species having being described within the last 10 years and some species belonging to other genera having been transferred to *Hemidactylus*. A region that has been investigated in 2012, comprises the Arabian Peninsula and its hinterland, which extends as far North as the Sinai, Jordan, Iraq and Iran and is known to contain at least 16 recognized taxa of *Hemidactylus* (Carranza & Arnold, 2012).

Some individuals of these forms were included in the molecular study on the phylogenetic relationships of *Hemidactylus* by Carranza and Arnold (2006) and, Busais and Joger (2011a) and Moravec *et al.* (2011).

The way in which species of the Arabian *Hemidactylus* separate ecologically is surprisingly varied. They may occur at similar altitudes but replace each other geographically, or if they are sympatric there may be altitudinal separation. Humidity may also be an important factor, and

when animals exist within a few meters of each other, structural niche may be significant (Disi, 1993).

The type locality of *Hemidactylus persicus* was restricted to Shiraz, Persia (=Iran) by Smith (1935). Morphologically typical animals occur in Northeast Saudi Arabia (as far South as Al-Hufuf and perhaps Al-Riyadh), in Bahrain, Kuwait, and lowland Iraq, Southern Iran, Pakistan and Gujarat (India) (Anderson 1999; Leviton *et al.* 1992; Minton 1966; Sindaco & Jeremcenko 2008; Smith 1935; Vyas *et al.* 2006).

*Hemidactylus turcicus* (Linnaeus, 1758) has a mainly circum-Mediterranean distribution including many islands and with populations extending to the South along the Nile River up to the border with Sudan (Sindaco & Jeremcenko 2008). According to a phylogenetic study from Carranza and Arnold (2006), *H. turcicus* may have originated in the Middle East from where it moved westwards across the whole Mediterranean, eventually reaching the Atlantic Ocean.

Nader and Jawdat (1976:35) note, appropriately, that this species has been taken only in Baghdad and is as yet unknown elsewhere in Iraq. They speculate that it will be found in other parts of Iraq, since it is known from neighboring countries. Although we think it is an introduced species, we agree that it will be found elsewhere, especially in the larger towns, in houses (Leviton *et al.*, 1992:39).

*Hemidactylus flaviviridis* extends from Northern India, westwards around the coastal areas of the Arabian Peninsula, to the coast of Egypt, Sudan, Eritrea, Djibuti and Northern Somalia. According to Largen and Spawls (2010), its presence in Africa is believed to be the result of accidental introduction along with baggage or cargo carried by trading vessels. These specimens are not obviously different in morphology from animals elsewhere, including specimens from the species' main range in Northern India.

The bent-toad gecko, *Cyrtopodion scabrum*, found on both inside and outside walls of inhabited and abandoned buildings and gardens. It was found in the same building with *Hemidactylus turcicus*. They were all collected from Al-Kufa city at geographical coordinates 044° 22' 17.3" E, 32° 8' 05.7" N at 23 m.

Nader & Jawdat (1976) reported seven gecko species from southern Iraq (*Cyrtopodion scaber*, *Cyrtopodion heterocercum*, *Stenodactylus doriae*, *Stenodactylus sleveni*, *Bunopus tuberculatus*, *Asaccus elisae*, *Hemidactylus flaviviridis*, *Hemidactylus persicus*). Two of these (*H. flaviviridis* and *H. persicus*) were also found by Al-Barwari & Saeed (2007) in the same region. To what extent any of these species occurred within the Marshes – as opposed to merely near them- was not reported.

From the Family Uromastixidae, the Egyptian spiny-tailed agama, *Uromastix aegyptius*, was found also in Bahr Al-Najaf at geographical coordinates 044° 15' 54.5" E 31° 53' 59.6"N at an elevation of 47 m. This large lizard occurs in semi-arid and arid areas with bushes and limited cultivated orchard.

Leviton *et al.* (1992:76) mention that the range of this species is the area at the head of the Persian Gulf on either side of the Shatt-al-Arab in extreme southwestern Iran and extreme southeastern Iraq (Basra & Fao). These authors do not mention Al-Najaf as the distribution range for this taxon.

Moody (1987:287) states that the spinous scales on the flanks of *U. aegyptius* have been used to distinguish it from *U. microlepis*, known from the Arabian Peninsula, Syria, and Iraq and *U. aegyptius* from the Sudan, Egypt, and Sinai. This author found that the spinous scales vary throughout the range of both taxa and could not discover apomorphic trends in any of the otherwise variable but potentially diagnostic characters by which to separate the two taxa. He



therefore regarded them as synonymous. Earlier, Arnold (1986a: 416) had treated *microlepis* as a subspecies of *aegyptius*.

From the Family Varanidae, the subspecies *Varanus griseus griseus* which is the lowland form ranging across the Arabian desert, Iraq, Syria, Jordan, Lebanon, and North Africa was recorded from the studied area. It had already been collected from Bahr AL-Najaf at the geographical coordinates 044° 15' 52.3" E , 31° 52' 28.5" N at an elevation of 19 m, it reaches a maximum size of about 1200mm TL in Iraq and is called desert monitor, "harwal" (Khalaf, 1959). A subspecies of *Varanuns griseus caspius* was collected from Hawraman Mountain, Kurdistan Province, northeast of Iraq for the first time by Lahony et.al., (2013). Total size seems to depend on the climate of the area, with largest specimens coming from areas which yield more food or allow longer activity seasons.

#### ACKNOWLEDGMENTS

We are grateful to the Iraqi Ministry of Higher Education and Scientific Research for their kind collaboration. We also thank the Department of the Environment in Al-Najaf Province, Iraq for providing facilities and for their efforts in collecting specimens. Finally, we thank the authorities of Razi University (Kermanshah Iran) for their support during field work.

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