

MARSH BULLETIN

Morphometric and meristic characteristics of *Echis carinatus* (Schneider 1801) inhabiting Al-Qadisiyah Governorate, Iraq

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Abstract

Echis carinatus (Schneider 1801) specimens were surveyed in four localities representing different habitats. Specimens were collected monthly for the period of September 2018 to August 2019 by several methods. A total of (43) specimen were collected during nine months (February to October). The highest number of snakes were recorded during July, which amounted to nine samples. The species preferred semi-desert habitats, places of sandy soil with many irrigational channels covered by dense vegetation, and grains cultivation farms that use huge quantities of water. It avoids agricultural areas with dense human activity. Species morphometric and meristic characteristics were measured. The female ratio exceeds males.

Keywords: Snake, herpetofauna, habitat, sex ratio, Iraq

Introduction

Snakes are an important ecological component in the ecosystem for their significant role in the food web as predator and biological controllers and serve as prey to a wide variety of predators (Latifi, 1991). Despite their importance, they have a bad reputation due to the lethal bites of some species. This reputation led to scarce studies on snakes, especially in Iraq. Snakes are considered a great source of danger in Al-Diwaniyah province due to most of the snake bites recorded in Al-Diwaniyah province hospitals were poisonous and lethal. The need to identify snake species is vital for the type of antidotes used to treat snakebites. There were scarce studies conducted on snake recordings in Iraq, including Boulenger (1920) while other studies like Corkill (1932), Allouse (1955), Khalaf (1959; 1960; 1961), Reed and Marx (1959), Mahdi and Georg (1969) and Nader and

Jawdat (1976) prepared checklists of herpetofauna of Iraq. Leviton *et al.* (1992) prepared a review and identification of the Middle East herpetofauna, including Iraqi snakes. Several Iraqi scientists recorded snakes from different habitats like Yousif (1995), Afrasiab and Ali (1996), Husain *et al.* (2002), Al-Barwari and Saeed (2007), Afrasiab *et al.* (2012), Afrasiab and Mohamad (2014), Mohamad and Afrasiab (2015), Rhadi *et al.* (2015a,b), Al-Barazengy *et al.* (2015), Habeeb and Rastegar-Pouyani (2016), Rhadi (2016), Anah (2018), and Salman (2019), prepared new checklists for the Iraqi herpetofauna. Several lethal bites of *E. carinatus* were recorded in the middle and southern parts of Iraq. The present study is conducted to identify the species through morphometric characteristics to be identified easily for medical treatment and the distribution of the species in Al-Qadisiyah Governorate.

Materials and methods

Specimens of *Echis carinatus* were collected monthly from September 2018 to August 2019 from four localities in Al-Qadisiyah Governorate (Fig. 1). The first station located in Al-Badiri province (N: 31 56' 08", E: 45 29' 21"), the second station at Ghamas province (N: 31 44' 58", E: 44 37' 49"), the third station at Al-Senia province (N:32 03 41 E:44 45 59) and the fourth station at Sumer province (N:32 09 51 E:45 02 02). Al-Badiri province represents the semi-desert habitat. Ghamas area is characterized by sandy soil with many irrigational channels and covered by dense vegetation. Al-Senia province is an agricultural area inhabited by citizens. Sumer province used for grains cultivation such as *Hordeum vulgare*, *Oryza sativa*, *Triticum aestivum*, and *Zea mays* with dogs, birds, lizards, and frogs. Samples were collected by hunting with some useful snake control tools and traps. Several morphometric characteristics were measured and recorded using measuring tape and digital vernier caliper. Species was identified according to Leviton *et al.* (1992). Several morphometric measurements (head length, head width, upper lip length, lower lip length, eye diameter, interorbital distance,

distance between nasals, eye nasal distance, eye rostral distance, total body length, tail length, anal scute width) and meristic accounts (upper lip scales, lower lip scales, number of scales between eyes, number of scales bordering eyes, number of scute rows between eye and upper lip, number of abdominal scales, number of tail scales). Body, abdomen, and head colors, as well as sex, were recorded. Temporal occurrence of the species throughout the year was recorded too.

The maximum size of *E. carinatus* collected was 50cm. This species' main noticed character is the cross-shaped mark on the back of the spade-like head (fig.3). The short neck can distinguish the head easily. Three to four enlarged scales are forming a distinguished edge above the eye (Fig.4). Head scales are small and irregular. Three scales separate nostrils. There is a fade ribbon connecting the eye to the rear opening of the mouth. Body scales are characterized by a rough texture (saw-scaled) and light brown color (Fig.3). Thirty white spots distinguish the back. The abdomen is white with small black spots. Abdominal scales are as wide as body width (Fig.5). The body shape is cylindrical with a short tail. There are two movable poisonous fangs on the anterior part of the upper jaw (Fig.4).



Fig. (3): Dorsal view of *E. carinatus*



Fig. (4): Head and fangs of *E. carinatus*.



Fig. (5) Ventral scutes of *E. carinatus*.

Morphometric and meristic characteristics of *E. carinatus* are shown in table (1).

Table (1): Morphometric and meristic characteristics of *E. carinatus* recorded in Al-Qadisiyah Governorate.

Character	Range		mean		Standard deviation	
	male	female	male	female	male	female
No. of Abdominal scales	170-179	169-180	173.8	176.6	4.1	3.95
No. of caudal scales	29-30	27-30	29.2	28.6	0.45	0.98
No. of dorsal scale rows	29-30	27-32	29.4	29.9	0.55	1.57
No. lower lip scales	12	12	12	12	0	0
No. of upper lip scales	10	10-11	10	10.6	0	0.5
Upper lip length (mm.)	10.5-21	12-24	16.4	20.7	0	4.04
Lower lip length (mm.)	10-21	12-24.5	16.4	20.6	5.4	4.09
Body length (cm.)	20-50	19-55	36	46.1	15.38	11.19
Tail length (cm)	2-4.5	2-4.5	3.2	3.9	1.15	0.63
Head length (mm.)	14-29	16-31.5	21.5	25.9	6.82	5.02
Head width (mm.)	7.5-18.5	10-20.8	13.6	17.8	5.1	3.6
Eye diameter (mm.)	2-4	2-4.5	3.2	3.9	1.1	0.9
Inter-orbital distance (mm.)	3-7	3-8.5	5.1	6.5	2.2	1.9
Inter-nostril distance (mm.)	2-4.5	2.5-5	3.4	4.1	1.08	0.9
Eye-nostril distance (mm.)	2.5-4	2.5-5	3.2	3.9	0.9	1
Eye-snout distance (mm.)	3-6	3-7	4.7	5.7	1.4	1.4
Tail/body length	0.08-0.11	0.07-0.1	0.09	0.09	0.01	0.01
Head length/head width	1.4-1.9	1.3-1.6	1.6	1.5	0.17	0.12
Orbital diameter/ head width	0.22-0.27	0.2-0.24	0.23	0.22	0.025	0.013
Inter-nostril/head width	0.22-0.27	0.18-0.25	0.26	0.23	0.045	0.029
Eye-snout distance/head width	0.27-0.47	0.26-0.36	0.36	0.32	0.074	0.033
Eye-nostril distance/head width	0.22-0.33	0.16-0.26	0.24	0.22	0.048	0.034

The overall sex ratio was 1:1.41 in favor of females.

Discussion:

Corkill (1932) and Leviton et al. (1992) recorded the species in Iraq. It was also recorded from Astolae Island in Pakistan Mertens (1971), Iran (Latifi, 1991), south India (Mallow *et al.*, 2003), and from Oman (Leviton *et al.*, 1992 and Mazuch, 2005). This means that the species is distributed from Arabian Peninsula as a southwest border to south India at the southeast, Pakistan at the northeast and Iraq at the northwest. Corkill (1932) recorded the first time *E. carinata* from Al-Diwaniyah and since that, it has not been recorded till 2012 from Said Dakheel village by Afrasiab *et al.*

(2012) and Rhadi *et al.* (2015c) from Al-Tannimah in Basrah province.

The species characteristics shown in this study's results agree with that mentioned by Mallow *et al.* (2003). Morphometric accounts and meristic measurements showed a higher range than that mentioned by Rhadi (2016) due to the large numbers examined and higher range of specimen size.

The habitat of *E. carinata* varies from sand, rock, silty soil, and scrublands (Latifi, 1991). Flat rocks and brush piles are also other species habitats (Phelps, 2010). It has been recorded from three locations representing different habitats: semi-desert habitat, sandy soil with many irrigational

channels covered by dense vegetation and grains cultivation farms that need huge quantities of water supply. It disappeared only from Al-Senia province, characterized as an agricultural area with dense human activity.

A medium-sized snake rarely exceeds 70cm (Rhadi *et al.*, 2015a), but we could not capture specimens exceeding 50cm throughout the study period.

We found that the ratio of males to females (1:1.41) is tending to be more balanced than what Rhadi (2016) found (1:3.75) of 19 specimens.

References:

- Afrasiab S. R., Al-Ganabi, M. I., Alfartosi, K. (2012): Snake species new or rare to the herpetofauna of Iraq. *Short note Herpetozoa*, 24 (3/4): 179 – 181.
- Afrasiab, S. R., and Ali, H. A. (1996). Notes on Scholecophidians (Blind Snakes) Reptilia-Serpents, of Iraq. *Bull. Iraq Nat. Hist. Mus.*, 8(4): 31 – 39.
- Afrasiab, S. R., and Mohamad, S. I. (2014): New records of snakes from Iraq (Reptilia: Colubridae), *Zoology in the Middle East*, 60 (1) 92-94.
- Al-Barazengy, A. N.; Salman, A. O. and Abdul Hameed, F. T. (2015). Updated list of amphibians and reptiles in Iraq 2014. *Bull. Iraq nat. Hist. Mus.* 13 (4): 29-40.
- Al-Barwari, S. E. and Saeed, I. (2007). On the helminth fauna of some Iraqi reptiles. *Turk. Parazitol. Derg.*, 31 (4): 330-336.
- Allouse, B .E. (1955). A bibliography on the vertebrate fauna of Iraq and neighbouring countries. III. Reptiles and amphibians. *Iraq Nat. Hist. Mus. Publ.* No. 6: 1-23.
- Anah, S. A. (2018). Biological studies of parasitic infections of some Iraqi snakes species in Al-Diwaniyah province. Thesis submitted to College of Education. Univ. Al-Qadisyah. 149p.
- Boulenger, G. A. (1920): A List of Snakes From Mesopotamia. Collected By Members Of The Mesopotamian Expeditionary Force, 1915 To 1919. *J. Bombay Nat. Hist. Soc.*, 27(2): 25-28.
- Corkill N. L. (1932): “Snakes and snake bite in Iraq: A Handbook for medical office. Pulished for the Royal College of Medicine of Iraq ”, by Bailliere, Tindall and Cox 7&8, Hernrietta Street. London, W.C.2. ix, + p.51.
- Habeeb, I. N. and Rastegar-Pouyani, N. (2016). Geographical distribution of the snakes of Iraq. *Meso. Env. j.* 2(3): 67-77.
- Hussain, N. A.; Yousif, U. H. and Mohamed, A. R. M. (2002). Occurrence of poisonous sea snakes (Hydrophis cyanocinctus and Hydrophis ornatus) in Iraqi marine waters. *Mar. Meso.*, 17 (2): 377-382.
- Khalaf, K. T. (1959): Reptiles of Iraq with some notes on the amphibians. Ar Rabitta Press, Baghdad: 96.
- Khalaf, K. T. (1960). Notes on a collection of lizards and snakes from Iraq. *Iraq Nat. Hist. Mus. Publ.* (18): 12-18.
- Khalaf, K. T. (1961). Some new records of lizards from Iraq. *Bull. Iraq Nat. Hist. Mus.* 1 (6): 1-2.
- Latifi, M. (1991). The snakes of Iran. Society for the Study of Amphibians and Reptiles. Contributions to Herpetology. 7. VIII, + 159 pp.
- Leviton, A. E.; Anderson, S. C.; Adler, K. and Minton, S. A. (1992). Handbook to Middle East amphibians and reptiles. (Society for the Study of Amphibians and Reptiles). Contrib. Herpetol.8: 1-252.
- Mahdi, N. and Georg, P. V. (1969). A systematic list of the vertebrates of Iraq. *Iraq Nat. Hist. Mus. Publ.* (26): 1-104.
- Mallow, D., Ludwig, D. and Nilson, G. (2003): True Vipers :Natural History and Taxonomy of Old World Vipers.

- Krieger Publishing Company. Malabar, Florida, vii + 359.
- Mazuch T. (2005): Taxonomy of Vipers of the genus *Echis* Merrem 1820. *Akva Tera Forum* 1-15.
- Mertens, R. (1971): Die Amphibien und Reptilien West-Pakistans, 1. Nachtrag. Stuttgart: Beiträge zur Naturkunde 216: 1-4.
- Mohamad, S. I. and Afrasiab, S. R. (2015). Two new records of dwarf snakes of the genus *Eirenis* (reptilia, colubride) in Iraq kurdistan (north and northeastern of Iraq) annotated checklist, for the genus *Eirenis* in Iraq. *Bull. Iraq Nat. Hist. Mus.* (2015) 13 (3): 77-83.
- Nader, I. A. and Jawdat, S. Z. (1976). Taxonomic study of the geckos of Iraq (Reptilia: Gekkonidae). *Bull. Biol. Res. Cent. Univ. Baghdad.* 5: 1-41.
- Phelps, T. (2010): Old world vipers: A natural history of the Azemiopinae and Viperinae. Chimaira, Frankfurt, 558 pp. Reed and Marx (1959),
- Rhadi, F. A. (2016). Title of the Thesis Systematics of semi-venomous and venomous snakes of central and southern Iraq and molecular phylogeny of the genus *Echis* in Iraq (Ophidia: Viperidae). Razi university Faculty of Science Department of Biology: 260.
- Rhadi, F. A., Rastegar-Pouyani, N., Karamiani, R., Mohammed, R. G. (2015a): Taxonomic status of sand boas of the genus *Eryx* (Daudin, 1803) (Serpentes: Boidae) in Bahr AlNajaf depression, Al-Najaf Province, Iraq. *Iranian Journal of Animal Biosystematics*, 11(2): 87-94.
- Rhadi, F. A., Rastegar-Pouyani, N., Mohammed, R. G., Karamiani, R., (2015b): On the Occurrence of the Species Group of Whip Snakes: *Coluber jugularis* Linnaeus, 1758, *C. caspius* Gmelin, 1789 and *C. schmidtii* Nikolsky, 1909 (Serpentes: Colubridae) in Southern Iraq. *Indian Journal Of Natural Sciences*, 5(30): 7355-7365.
- Rhadi, F. A., Rastegar-Pouyani, N., Karamiani, R., Mohammed, R. G. (2015c): First record and range extension of Saw Scaled Viper, *Echis carinatus sochureki* Stemmler, 1969 (Squamata: Viperidae), from AL Basra, Southern Iraq. *Amphibian and Reptile Conservation*; 9(2): 6-9.
- Salman**, N. A. (2019). A review of southern Iraq herpetofauna. *Biol. Apple. Environ. Res.* 3 (1): 61-71.
- Yousif**, U. H. (1995). The occurrence and biology of two sea snakes *Hydrophis cyanocinctus* Daubin and *Hydrophis ornatus* (Gray) in Khor Al-Zubair lagoon, northwest Arabian Gulf, Iraq. *Mar. Mes.* 10 (1): 27-34.