

Vertebrate Specimens Deposited at Kurdistan Natural History Museum

Zohair I. F.Rahemo* and Sarbaz I. Mohammed

Biology Department, College of Science, Salahaddin University-Erbil, Kurdistan, Iraq

Received: July 23, 2020; Revised: August 22, 2020; Accepted: September 15, 2020

Abstract: The Kurdistan Natural History Museum (KNHM) at Salahaddin University is a recognized Iraqi university-based museum. It serves as an important resource for undergraduate and graduate education, with the aim of collecting and studying the biodiversity in Iraq especially of vertebrates (fishes, amphibians, reptiles, birds, and mammals) since 2003. A total of 106 specimens of vertebrates were collected from the Kurdistan region, including Erbil, Duhok, and Sulaimaniyah provinces and northeastern Iraq. The specimens included nineteen species of fishes belonging to four families, four amphibians belonging to four families, forty-one reptiles belonging to nine families, twenty-five bird species belonging to fourteen families, and nineteen species of mammals belonging to eleven families. All specimens were preserved, or taxidermed in a standard method followed by international museums. Some suggestions are listed to improve and increase the number of museum specimens.

Keywords: Vertebrates, Kurdistan Natural History Museum, Iraq

Introduction

Preserving animals in special spaces such as museums is very important and constitutes a database for researchers from which they can conduct studies on different aspects in biology, including taxonomy, systematics, biodiversity, and evolution. There are several references worldwide concerned with vertebrates' classification, anatomical

structures, ecology, local nomenclature, and zoogeographical distribution. In Iraq, biological researches, both old and new, have contributed to each category. Also, local natural history museums play a big role in documenting the biodiversity of countries by housing types and voucher specimens of described species for comparison and to be sources for scientific discoveries and inspiration (Allmon, 1994; Qumsiyeh and Amr, 2020).

The fauna of Iraq has been subject for studies over the past years. The most comprehensive studies on the vertebrates of Iraq include freshwater and marine fishes (Khalaf, 1961; Al-Daham, 1977, 1979, 1982, 1984; Al-Rudainy, 2008; Coad, 2010), reptiles and amphibians (Khalaf, 1959; Rahemo and Mohammed, 2014; Al-Barazengy et al., 2015), birds (Allouse, 1960; 1962), and mammals (Hatt, 1959; Harrison and Bates, 1991).

Recent papers have included new records or descriptions of new species of the reptiles of Iraq (Afrasiab and Ali, 1989; Afrasiab and Mohammed, 2009, 2011, 2014; Afrasiab et al., 2013, 2018, 2019; Habeeb and Nasrulla, 2016; Habeeb, 2018). The aim of this study is to document the vertebrate fauna curated at the Kurdistan Natural History Museum (KNHM) for researchers and professionals.

Materials and Methods

Collected specimens kept at the KNHM of the College of Science at Salahaddin University in Erbil, Iraq, are listed together with the number of specimens, locality, and date of collection. Figures 1 show Kurdistan's three provinces and the location of the Kurdistan Natural History Museum.

*Corresponding author: zohair.f.rahemo@gmail.com

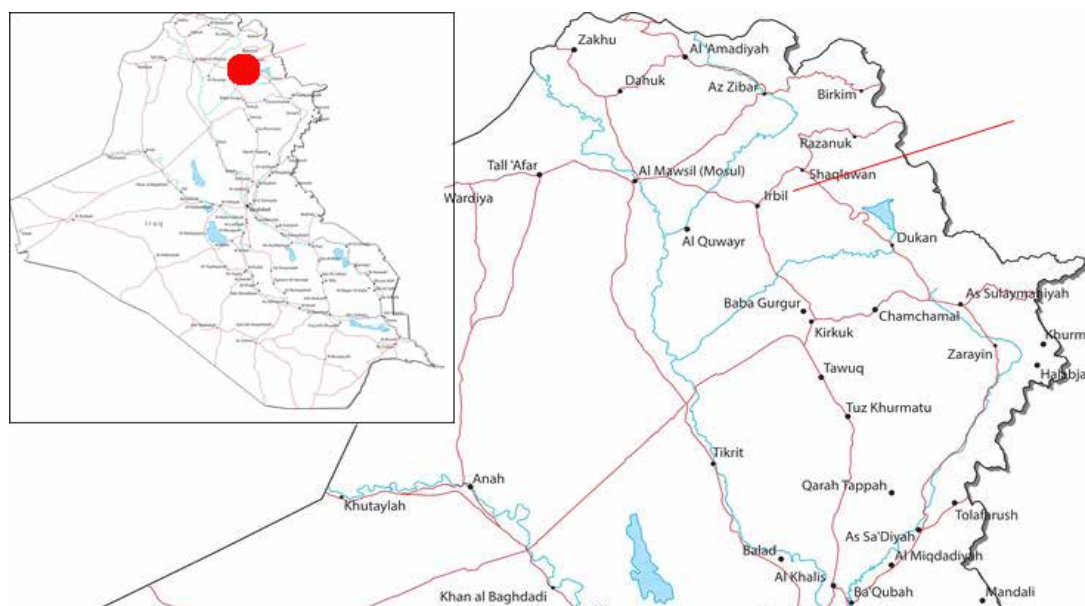


Figure 1. Map of Iraq with Kurdistan’s three provinces and the location of the Natural History museum (KNHM).

Results

Freshwater Fishes

Nineteen species of freshwater fishes belonging to four families are listed below (Table 1).

Amphibians

Four species of amphibians belonging to four families are listed below (Table 2).

Reptiles

Forty-one species of reptiles within 13 families are listed below (Table 3).

Birds

Twenty five species of birds belonging to fourteen families are listed below (Table 4).

Mammals

A total of nineteen species of mammals are listed below (Table 5).

Table 1. List of freshwater fishes at KNHM collection.

Family	Specimens	No	Location	Date
Cyprinidae	<i>Alburnus mossulensis</i> Heckel, 1843	5	Upper Zab river	August 2009
	<i>Aspius vorax</i> Heckel, 1843	3	Upper Zab river	August 2009
	<i>Barbus barbulus</i> Heckel, 1849	3	Upper Zab river Dukan lake	August 2009 February 2015
	<i>Barbus grypus</i> Heckel, 1843	3	Upper Zab river Dukan lake	August 2009 February 2015
	<i>Cyprinus carpio</i> Linnaeus, 1758	5	Upper Zab river Dukan lake	August 2009 February 2015
	<i>Carassius carassius</i> (Linnaeus, 1758)	3	Upper Zab river Dukan lake	August 2009 February 2015
	<i>Carasobarbus luteus</i> (Heckel, 1843)	4	Upper Zab river Dukan lake	August 2009 November 2014
	<i>Capoeta barrios</i> Lortet in Barrois, 1894	5	Upper Zab river	September 2010
	<i>Capoeta trutta</i> (Heckel, 1843)	4	Upper Zab river	July 2010

	<i>Chondrostoma regium</i> (Heckel, 1843)	4	Upper Zab river Dukan lake	August 2009 October 2014
	<i>Cyprinion macrostomum</i> Heckel, 1843	4	Upper Zab river Dukan lake	August 2010 October 2014
	<i>Garra rufa</i> (Heckel, 1843)	5	Upper Zab river	April 2010
	<i>Garra vsriabilis</i> (Heckel, 1843)	4	Upper Zab river	April 2010
	<i>Luciobarbus esocinus</i> (Heckel, 1843)	3	Upper Zab river Dukan lake	August 2009 October 2014
	<i>Luciobarbus xanthopterus</i> (Heckel, 1843)	3	Upper Zab river Dukan lake	August 2009 October 2014
	<i>Squalius cephalus</i> (Linnaeus, 1758)	3	Upper Zab river	April 2010
Sisoridae	<i>Glyptothorax kurdistanicus</i> (Berg, 1931)	3	Upper Zab river Dukan lake	July 2010
Siluridae	<i>Silurus triostegus</i> Heckel 1843	2	Upper Zab river	May 2013
Mastacembelidae	<i>Mastacembelus mastacembelus</i> (Banks & Solander in Russel, 1794)	4	Upper Zab river Dukan lake	August 2010 April 2014

Table 2. List of amphibians at KNHM collection

Family	Specimens	No	Location	Date
Salamandridae	<i>Neurergus crocatus</i> Cope, 1862	4	Duhok Erbil	May 2016
Ranidae	<i>Pelophyylax ridibundus</i> (Pallas, 1771)	5	Erbil	May 2006
Bufoidea	<i>Bufo Pseudepidalea viridis</i> (Laurenti, 1768)	5	Erbil	April 2006
Hylidae	<i>Hyla savignyi</i> (Audouin 1829)	5	Erbil Sulaimaniyah	March 2015

Table 3. A List of the reptiles in the KNHM collection

Family	Specimens	No.	Location	Date
Testudinidae	<i>Testudo graeca</i> Pallas, 1814	3	Erbil	May 2013
Gekkonidae	<i>Asaccus griseonotus</i> (Dixon & Anderson, 1973),	5	Sulaimaniyah	June 2009
	<i>Asaccus elisae</i> (Werner, 1895),	1	Mosul	May 2007
	<i>Asaccus saffinae</i> Afrasiab & Mohammed, 2009	4	Erbil	June 2008
	<i>Cyrtopodium scabrum</i> (Heyden, 1827),	5	Erbil Duhok Sulaimaniyah	May 2005
Agamidae	<i>Laudakia nupta nupta</i> (De Fillippi, 1843),	6	Erbil Duhok Sulaimaniyah	June 2009
	<i>Paralaudakia caucasia</i> (Eichwald, 1831)	3	Erbil Duhok	May 2010
	<i>Trapelus ruderatus</i> (Olivier, 1804)	4	Erbil Duhok	August 2009
Lacertidae	<i>Lacerta mediamedia</i> Lantz & Cyren, 1920,	5	Erbil Duhok	May 2008
	<i>Ophisops elegans</i> Menetries, 1832	4	Erbil Duhok Sulaimaniyah	May 2010

Varanida	<i>Varanus griseus</i> (Daudin, 1803)	1	Erbil Duhok Sulaimaniyah	May 2018
Scincidae	<i>Heremites vitiata</i> (Olivier, 1804)	5	Erbil Duhok Sulaimaniyah	April 2010
	<i>Heremites aurata</i> (Linnaeus, 1758)	4	Erbil Duhok Sulaimaniyah	August 2008
Anguidae	<i>Ophisaurus apodus</i> Pallas, 1775)	2	Sulaimaniyah	June 2009
Typhlopidae	<i>Typhlops vermicularis</i> (Merrem, 1820)	4	Erbil Duhok	July 2010
Leptotyphlopidae	<i>Leptotyphlops macrorhynchus</i> (Jan, 1860)	5	Erbil Duhok	May 2010
Boidae	<i>Eryx jaculus jaculus</i> (Linnaeus, 1758)	3	Erbil	April 2017
Colubridae	<i>Dolichophis jugularis</i> (Linnaeus, 1758)	2	Erbil Duhok	August 2010
	<i>Platyceps ventromaculatus</i> Gray, 1834		Erbil	May 2015
	<i>Eirenis lineomaculata</i> Schmidt, 1939	2	Erbil	May 2017
	<i>Eirenis persicus</i> (Anderson, 1872)	1	Erbil	April 2015
	<i>Eirenis decemlineata</i> (Dumeril, Bibron & Dumeril, 1854)	1	Erbil	May 2018
	<i>Eirenis collaris</i> (Ménétriés, 1832)	3	Sulaimaniyah	June 2016
	<i>Eirenis coronella</i> (Schlegel, 1837)	1	Sulaimaniyah	May 2017
	<i>Eirenis rothii</i> Jan, 1863	3	Erbil Duhok	April 2014
	<i>Eirenis thospitis</i> Schmidtler & Lanza, 1990	2	Sulaimaniyah Erbil	April 2016
	<i>Hemorrhhis nummifer</i> (Reuss, 1834)		Erbil	April 2009
	<i>Hemorrhhis ravergeri</i> (Ménétriés, 1832)	2	Erbil	June 2010
	<i>Malpolon insignitus</i> (Geoffroy Saint-Hilaire, 1827)	2	Kirkuk	September 2016
	<i>Natrix tessellata</i> (Laurenti, 1768)	5	Erbil Duhok Sulaimaniyah	July 2010
	<i>Natrix natrix</i> (Pallas, 1814)	2	Erbil Mosul	June 2011
	<i>Rhynchocalamus melanocephalus</i> (Jan, 1862)	4	Erbil Duhok	April 2010
	<i>Platyceps rogersi</i> (Anderson, 1893)	1	Erbil	May 2013
<i>Psammophis schokari</i> (Forskål, 1775)	1	Erbil	June 2012	
<i>Spalerosophis diadem acliffordii</i> (Schlegel, 1837)	2	Sulaimaniyah Erbil	March 2014	
<i>Spalerosophis microlepis</i> (Jan, 1865)	2	Sulaimaniyah	August 2013	
<i>Telescopus tessellatus martini</i> (Schmidt, 1939)	1	Erbil	May 2015	
<i>Zamenis hohenackeri</i> (Strauch, 1873)	2	Erbil	May 2009	
Elapidae	<i>Walterinnesia morgani</i> (Mocquard, 1905)	1	Kirkuk	May 2015
Viperidae	<i>Macrovipera lebetina</i> (Dwigubsky, 1832)	3	Erbil Duhok Kirkuk	June 2010

Table 4. A List of Birds in the KNHM collection

Family	Specimens	No	Location	Date
Columbidae	<i>Columba livia</i> Gmelin, 1789	3	Erbil Duhok Sulaimaniyah	September 2006
	<i>Streptopelia senegalensis</i>	2	Erbil Duhok Sulaimaniyah	July 2005
	<i>Streptopelia decaocto</i> (Frivaldszky, 1838)	2	Erbil Duhok Sulaimaniyah	April 2006
Pteroclididae	<i>Pterocles alchata</i> (Linnaeus, 1766)	2	Erbil Mosul	August 2003
Phasianidae	<i>Alectoris chukar</i> (Gray, JE, 1830)	3	Erbil Duhok	February 2003
	<i>Francolinus francolinus</i> (Linnaeus, 1766)	2	Erbil	March 2003
	<i>Ammoperdix griseogularis</i> (von Brandt, 1843)	1	Unknown	May 2004
	<i>Gallus gallus domesticus</i> (Linnaeus, 1758)	3	Erbil	February 2004
Meropidae	<i>Merops apiaster</i> Linnaeus, 1758	2	Erbil	April 2008
Strigidae	<i>Bubo bubo</i> (Linnaeus, 1758)	1	Sulaimaniyah	May 2008
Tytonidae	<i>Tyto alba</i> (Scopoli, 1769)	1	Unknown	April 2007
Accipitridae	<i>Aquila chrysaetos</i> (Linnaeus, 1758)	1	Unknown	June 2009
Ciconiidae	<i>Ciconia ciconia</i> (Linnaeus, 1758)	1	Sulaimaniyah	March 2007
Anatidae	<i>Anas platyrhynchos</i> Linnaeus, 1758	2	Unknown	September 2009
	<i>Cygnus olor</i> (Gmelin, JF, 1789)	1	Upper Zab river	May 2003
	<i>Mergellus albellus</i> (Linnaeus, 1758)	1	Upper Zab river	February 2004
Ardeidae	<i>Botaurus stellaris</i> (Linnaeus, 1758)	1	Unknown	June 2006
	<i>Ixobrychus minutus</i> (Linnaeus, 1766)	1	Unknown	June 2005
	<i>Ardea alba</i> Linnaeus, 1758	1	Upper Zab river	May 2007
Corvidae	<i>Corvus corax</i> Linnaeus, 1758	2	Unknown	July 2006
Sturnidae	<i>Sturnus vulgaris</i> Linnaeus, 1758	3	Erbil	May 2004
Laridae	<i>Larus michahellis</i> Naumann,1840	1	Upper Zab river	February 2006
	<i>Larus cachinnans</i> Pallas, 1811	1	Upper Zab river	June 2006
Rallidae	<i>Gallinula chloropus</i> (Linnaeus, 1758)	1	Unknown	March 2005

Table 5. List of mammals at KNHM collection

Family	Specimens	No.	Location	Date
Erinaceidae	<i>Erinaceus europaeus</i> (Linnaeus, 1758)	1	Erbil	September 2009
Rhinolophidae	<i>Rhinolophus sp.</i>	1	Unknown	March 2005
Muridae	<i>Mus musculus</i> (Linnaeus, 1758)	3	Erbil	May 2003
	<i>Apodemus sylvaticus</i> (Linnaeus, 1758)	2	Erbil	February 2004
	<i>Rattus rattus</i> (Linnaeus, 1758)	2	Erbil	June 2006
Sciuridae	<i>Sciurus anomalus</i> Gmelin, 1778	1	Duhok	June 2006
Felidae	<i>Lynx lynx</i> (Linnaeus, 1758)	1	Duhok	June 2005
	<i>Panthera pardus saxicolor</i> Pocock, 1927	1	Erbil	May 2011
Bovidae	<i>Capra hircus</i> (Linnaeus, 1758)	1	Erbil	July 2006
	<i>Capra aegagrus</i> (Erleben, 1777)	1	Duhok	May 2004

Leporidae	<i>Oryctolagus cuniculus domesticus</i> (Linnaeus, 1758)	2	Erbil	February 2006
Canidae	<i>Canis lupus</i> (Linnaeus, 1758)	1	Erbil	September 2009
	<i>Canis aureus aureus</i> (Linnaeus, 1758)	1	Duhok	May 2003
	<i>Canis familiaris</i> (Linnaeus, 1758)	1	Erbil	February 2004
	<i>Vulpes vulpes</i> (Linnaeus, 1758)	1	Erbil	June 2006
Mustelidae	<i>Mustela nivalis</i> (Linnaeus, 1766)	1	Unknown	June 2005
	<i>Lutra lutra</i> (Linnaeus, 1758)	1	Sulaimaniyah	May 2007
Ursidae	<i>Ursus arctos syriacus</i> (Hemprich & Ehrenberg, 1828)	1	Duhok	July 2006
Hyaenidae	<i>Hyaena hyaena</i> (Linnaeus, 1758)	1	Erbil	May 2004

Discussion

It is important to investigate the geographical distribution of all the species reported in this research in Iraq and the neighboring countries. For example, the cave-dwelling gecko, *Asaccus saffinae*, which has been described from Saffine Mountains in northern of Iraq is not known in any other locality in Iraq (Afrasiab and Mohammed, 2009).

The staff at the KNHM museum show great interest in conducting organized scientific field trips to the mountain regions in different habitats to collect representatives of the vertebrate fauna of this little known region. Collecting specimens over the past six years has been difficult due to the instability and regional conflict. The staff encourages people to donate specimens to the KNHM museum using all kinds of media. As the museum is frequently visited by school and university students, specialists, and guests from the government, its staff takes this opportunity to introduce the mission of the museum in order to fulfill its targets. Also, one of the important goals of the museum is to have more trained staff in taxonomy, exhibitions and to enable researchers of publishing scholarly papers.

Acknowledgements

Special thanks go to Mr. Saman R. Afrasiab, member of the Natural History Research Centre and Museum, Baghdad, for supporting our museum, his valuable advice, and for re-checking our data and classifying most vertebrates, especially reptiles collected from the Kurdistan region.

References

- Afrasiab, SR and Ali, HA. 1989. Report on collection of reptiles from Rumaila desert, South of Iraq. *Bulletin Iraqi Natural History Museum*, **8**: 65-73.
- Afrasiab, SR and Mohammed, SI. 2009. A study on cave-dwelling geckos in Iraq, with the description of a new species from Saffine Mountain. *Zoology in the Middle East*, **47**: 49-56.
- Afrasiab, SR, Al-Moussawi, AA and Hadi, HD. 2018. Annotated checklist of reptilian fauna of Basrah, South of Iraq. *Bulletin of the Iraq Natural History Museum*, **15 (1)**: 77-92.
- Afrasiab, SR, Al-Moussawi, AA, Hadi, HD and Mohammed S. I. 2019. Review of Opisthoglyphous Snakes (Reptilia, Ophidia) of Iraq. *Bulletin Iraqi Natural History Museum*, **15 (3)**: 335-342.
- Afrasiab, SR. and Mohammed, SI. 2011. First record of the Rat Snake, *Zamenis hohenackeri* (Strauch, 1873), from north-eastern Iraq with notes on other colubrid snakes. *Zoology in the Middle East*, **54**:19-22.
- Afrasiab, SR. and Mohammed, SI. 2014. New records of snakes from Iraq (Reptilia: Colubridae). *Zoology in the Middle East*, **60 (1)**:90-92.
- Afrosiab, SR, Mohamad, SI and Hossain, R. 2013. A review of the Lacertini of Iraqi collections (squamata: Sauria:Lacertidae). *Herpetozoa*, **25(3/4)**: 93-100.
- Al-Barazengy, AN, Salman, AO and Abdul Hameed, FT. 2015. Updated list of Amphibians and Reptiles in

- Iraq. *Bulletin Iraqi Natural History Museum*, **3(4)**: 29-40.
- Al-Daham N. K. 1977. **Fishes of Iraq and the Arab Gulf Vol. 1, Squaliformes to Atheriniformes**. Centre for Arab Gulf Studies, Publication No. 9. Basrah University Press (in Arabic).
- Al-Daham, NK. 1979. **Fishes of Iraq and the Arab Gulf. Vol. 2, Order Beryciformes to Order Perciformes (Suborder Percoidei)**. Basrah University Press. (in Arabic).
- Al-Daham, NK. 1982. The Ichthyofauna of Iraq and Arab Gulf. A check-list. *Basrah Natural History Museum*, **4**:1-102.
- Al-Daham, NK. 1984. **Fishes of Iraq and the Arab Gulf. Vol.3**. Basrah University press.
- Allmon WD. 1994. The Value of natural history collections. *Curator: The Museum Journal*, **37(2)**: 83–89.
- Allouse, B. 1960. **Birds of Iraq**. Al-Rabita Press, Baghdad.
- Allouse, B. 1962. **Birds of Iraq. Vol. 3. Order Passeriformes**. Al-Rabita Press, Baghdad.
- Al-Rudainy, A. 2008. **Atlas of Iraqi Freshwater Fishes**. Republic of Iraq, Ministry of Environment.
- Coad, BW. 2010. **Freshwater Fishes of Iraq**. Pensoft. Sofia-Moscow.
- Habeeb, IN. 2018. Check list lizards of Iraq. *Mesopotamia Environmental Journal*, **4**:25-33.
- Habeeb, IN. and Nasrulla, R. 2016. Geographical Distribution of the Snakes of Iraq. *Mesopotamia Environmental Journal*, **2**: 67-77.
- Harrison, DL and Bates, PJJ. 1991. **The Mammals of Arabia**. 2nd Edition. Harrison Zoological Museum Publication.
- Hatt, RT. 1959. The mammals of Iraq. *Miscellaneous publications (University of Michigan. Museum of Zoology)*, **106**: 1-113.
- Khalaf K.T. 1961. The Marine and Freshwater fishes of Iraq. Al-Rabita, Baghdad.
- Khalaf, KT. 1959. **Reptiles of Iraq with some Notes on the Amphibians**. Al-Rabita Press, Baghdad.
- Qumsiyeh, M and Amr, Z. 2020. Protection of endangered ecosystems via museum research and education: experience from Palestine and proposal for the Arabian Gulf. *Museums in the Middle East*, **2**: 29-32.
- Rahemo, ZIF and Mohammed SI. 2014. Lizards biodiversity of arid regions in Iraq. *Journal of Genetic and Environmental Resources Conservation*, **2(1)**: 46-53.