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ORIGINAL ARTICLE

CHECKLIST OF BIVALVIA (MOLLUSCA) IN IRAQ

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ABSTRACT

This study presents a comprehensive list of the freshwater and marine bivalves distributed in Iraq. A total of 51 species were recorded, and distributed as: 14 freshwater species, and 37 marine species, these species belonging to 25 families, all available remarks on the distribution, taxonomy, and nomenclature of these species were given. This study included the recently collected specimens along with those previously studied and recorded in Iraq.

Keywords: Bivalvia, Checklist, Freshwater, Iraq, Marine, Mussels.

INTRODUCTION

Iraq is characterized by having diverse aquatic environments that include a marine coast, rivers, marshes, and lakes that support the biodiversity of various biological groups (including bivalvia); the Tigris and Euphrates Rivers are the Iraqi main water resources. The Iraqi marine coast represent the north-west part of the Arabian Gulf occupies an area of 64 km (Abbas *et al*., 2020), from the Arabian Gulf which has a surface area 239 Km² and differs from it due to the effect of sediments transferred from Shatt al-Arab (Al-Shamary *et al*., 2020).

A few studies concerned with the systematic study of mussels in Iraq were conducted, and many of the recorded species are considered synonyms for other species, many others are needed to be updated. In the earlier studies Annandale (1918) described some bivalve species of his collections from Iraq; some bivalvian species were described by Ahmed (1975), another species of bivalve were recorded in Iraq by Al-Hassan and Al-Hasani(1985), five more marine species were added to Iraqi malacofauna by Ali *et al*. (2017), recently, Bogan *et al*. (2021) recorded the freshwater mussel *Sinanodonta woodiana* (Lea, 1834) in Iraq; then Yasser *et al*. (2022) published a checklist that included the marine species, in this checklist, 32 taxa were reported including four species were described for the first time to Iraqi malacofauna, lastly, six other marine species were added to malacofauna of Iraq by Yasser *et al*. (2023) and Bashê (2022) made a study about the freshwater mussel *Unio tigridis* in the north of Iraq.

The current data will be important inputs for a better understanding of the mussel's biodiversity in Iraq. As with all lists, this list will undoubtedly require to be revised as additional research evidence becomes available. Therefore, the present paper aimed to study the biodiversity of bivalves and provide a comprehensive list of this group distributed in Iraq.

MATERIALS AND METHODS

Sampling: The specimens of the present study were collected by hand or by means of sieves, and then preserved in ethanol solution 70% (Forsyth, 1999). Dried shells were also collected and preserved.

The first collection was made from the Euphrates River north of Babylon, in October 2021, six alive specimens were collected. The second collection was from the Tigris River, north of Baghdad, in October 2021, three alive specimens were collected. The third collection made from the Canal of Euphrates River north of Babylon, in November 2021, about 30 shells were collected. In April 2022, four more specimens were obtained from the Tigris River in Al-Madain District, southeast Baghdad, and four more specimens were obtained from the Al-Dalmaj Marsh in April 2023. These specimens are deposited in the collection of mollusks at the Iraqi Natural History Research Center and Museum.

Identification: The identification of specimens was made according to many morphological characteristics such as shell shape, length, width, high and texture, and on the base of many identification keys and available literatures such as Popa *et al.*(2007) and Rogers and Thorp(2019). In order to correct and standardize the scientific names, all taxon names were checked by GBIF Secretariat (2022), Molluscabase (2023) and WoRMS (2023), the reference to the original description was based on Molluscabase (2023).

RESULTS

The current study recorded 51 species in total, distributed as: 14 freshwater species and 37 marine species within 12 orders, 25 families, and 43 genera. These taxa as follows:

Class: Bivalvia
1-Order: Adapedonta
Family: Solenidae
Solen vagina Linnaeus, 1758
Original description: *Solen vagina* Linnaeus, 1758. Systema Natura, 1:824pp.
Synonyms: *Solen brevis* Hanley, 1842
Solen abbreviates R. A. Philippi, 1843
Habitat: Marine
Distribution: Iraq (Ahmed, 1975). Turkey (Uysal, 1967); Thailand (Saeedi *et al*., 2016), Vietnam (Ambarwati and Irawan, 2020).

2-Order: Arcida
(A) Family: Arcidae
Acar plicata (Dillwyn, 1817)

Original description: *Arca plicata* Dillwyn, 1817. A descriptive catalogue of recent shells, arranged according to the Linnean method; with particular attention to the synonymy, 1: 1-580pp.
Synonyms: *Acar dubia digma* Iredale, 1939
Acar dubiakerma Iredale, 1939
Arca irioides Menke, 1843
Habitat: Marine.
Distribution: Iraq (Yasser *et al*., 2023). Kuwait, Arabian Gulf (Al-Kandari *et al*., 2020).

Anadara uropigimelana (Bory de Saint-Vincent, 1827)
Original description: *Arca uropigimelana* Bory de Saint-Vincent, 1827. Tableau encyclopédique et méthodique des trois règnes de la nature. Vers, coquilles, mollusques et polypiers.1: part29, pp83-84, 133-180.
Synonyms: *Anadara holoserica* (Reeve, 1843)
Arca holoserica Reeve, 1843
Anadara (*Anadara*) *uropigimelana* (Bory de Saint-Vincent, 1827)
Habitat: Marine.
Distribution: Iraq, it was recorded as *Arca uropyogomelana* a miss spelling of *Arca uropigimelana* Bory de Saint-Vincent, 1827 by Ahmed (1975). Red Sea and Gulf of Aqaba (Rusmore-Villaume, 2008); Central Pacific (Tebano and Paulay, 2000).

Barbatia decussata (Sowerby, 1833)
Original description: *Byssorca decussata* Sowerby, 1833.Proceedings of the Zoological Society of London. 1833: 16-22, 34-38.
Synonyms: *Arca decussate* (Sowerby, 1833)
Habitat: Marine.
Distribution: Iraq (Ali *et al*., 2017). Kuwait (Al-Yamani *et al*., 2012); Iran (Zeinalipour *et al*., 2014).

Barbatia foliata (Forsskål, 1775)
Arca foliata Forskål, 1775. Post mortem auctoris edidit Carsten Niebuhr. Hauniae, 1-20.
Synonyms: *Arca lima* Reeve, 1844
Arca corallicola Iredale, 1939
Arca nivea Röding, 1798
Habitat: Marine.
Distribution: It was recorded in Iraq under the name *Arca foliate* Forsskål, 1775 by Ahmed (1975). Red Sea (Rusmore-Villaume, 2008), China (Tan and Kastoro, 2004), and Western Central Pacific (Poutiers, 1998).

Barbatia trapezina (Lamarck, 1819)
Original description: *Arca trapezina* Lamarck, 1819. Histoire naturelle des animaux sans vertebres. 6(1):5+343 pp.
Synonyms: *Arca areolata* Deshayes, 1858
Barbatia oblonga Dunker, 1868

Barbatia petersii Dunker, 1871

Habitat: Marine.

Distribution: Iraq (Yasser *et al*., 2022). Al-Kuwait (Al-Kandari *et al*., 2020), and Red Sea (Rusmore-Villaume, 2008).

(B) Family: Neotiidae

Didimacar tenebrica (Reeve, 1844)

Original description: *Arca tenebrica* Reeve, 1844. Conchologia Iconica, or, illustrations of the shells of molluscous animals, 2: 1-17.

Synonyms: *Barbatia koshibensis* Hatai & Nishiyama, 1952

Didimacar repenta Iredale, 1939

Striarca tenebrica (Reeve, 1844)

Habitat: Marine.

Distribution: Iraq (Yasser *et al*., 2022). Kuwait (Al-Kandari *et al*., 2020).

(C) Family: Spondylidae

Spondylus foliaceus Schreibers, 1793

Original description: *Spondylus foliaceus* Schreibers, 1793. Zweyter Band. Von den Muscheln, pp. (1-9), 1-416.

Synonyms: *Spondylus costatus* Lamarck, 1819

Spondylus digitatus Perry, 1811

Spondylus nux Reeve, 1856

Habitat: Marine.

Distribution: Iraq, it was recorded as *Spondylus costatus* Lamarck, 1819 by Ahmed (1975). Indo-Pacific (Lamprell and Willan, 2000).

3-Order: Cardiida

(A) Family: Cardiidae

Vasticardium assimile (Reeve, 1844)

Original description: *Cardium lacunosum* Reeve, 1845. Conchologia Iconica, or, illustrations of the shells of molluscous animals, 2, pl.1-22.

Synonyms: *Acrosterigma lacunosum* (Reeve, 1845)

Trachycardium lacunosum (Reeve, 1845)

Habitat: Marine.

Distribution: In Iraq, it was recorded as *Acrosterigma lacunose* (Reeve, 1845) by Yasser *et al*. (2023). Kuwait and Arabian Gulf (Al-Kandari *et al*., 2020).

Vasticardium flavum (Linnaeus, 1758)

Original description: *Cardium flavum* Linnaeus, 1758. Editio decima, reformata (10^{th} ed.), 1: 824pp.

Synonyms: *Cardium fucatum* Spengler, 1799

Acrosterigma flavum flavum (Linnaeus, 1758)

Habitat: Marine.

Distribution: Iraq, it was recorded as *Laevicardium flavum* (Linnaeus, 1758) by Ahmed (1975). Indo-Pacific (Vidal, 1997).

(B) Family: Psammobiidae

Gari occidens (Gmelin, 1791)

Original description: *Solen occidens* Gmelin, 1791. *Systema Natura*, 1(6).

Synonyms: *Psammobia nivosa* Deshayes, 1855
Dysmea vitrea Dall, Batsch& Rehder, 1938
Solen occidens Gmelin, 1791

Habitat: Marine

Distribution: Iraq (Yasser *et. al*., 2022). Eastern Pacific (Coan, 2000).

(C) Family: Semelidae

Theora mesopotamica (Annandale, 1918)

Original description: *Corbula* (*Eeodona*) *mesopotamica* Annandale, 1018. Records of Indian museum. 15(3): 159-170.

Synonyms: *Abra cadabra* Eames & Wilkins, 1957
Corbula mesopotamica Annandale, 1918
Theora cadabra (Eames & Wilkins, 1957)

Habitat: Marine and Brackish.

Distribution: It was recorded in Iraq as *Corbula* (*Erodona*) *mesopatamica* Annandale, 1918 Annandale (1918). Kuwait (Al-Yamani *et al*., 2012).

4-Order: Carditida

Family: Condylocardiidae

Carditopsis coxii (Eames & Wilkins, 1957)

Original description: *Cuna coxi* Eames & Wilkins, 1957. Proceeding of the Malacological Society of London, 32(5): 198-203.

Synonyms: *Cuna coxi* Eames & Wilkins, 1957

Habitat: Marine.

Distribution: Iraq (Yasser *et al*., 2022).

5-Order: Myida

(A) Family: Dreissenidae

Dreissena polymorpha (Pallas, 1771)

Original description: *Mytulus polymorphus* Pallas, 1771. Reise durch verschiedene Provinzen des Russischen Reichs. 12, 504, 6 p.

Synonyms: *Dreissena locardi* Locard, 1893
Dreissena kuesteri Dunker, 1855

Materials examined: Three specimens, Tigris River, Baghdad, October 2021.

Habitat: Brackish-water, freshwater.

Distribution: Iraq (Al-Rawy, 2005). Turkey (Aksu *et al*., 2017), Black and the Caspian Sea Basins, and spreads across Europe (Karatayev *et al*., 1997).

Dreissena siouffi Bourguignat, 1893
Original description: *Dreissena siouffi* Bourguignat, 1893. Revue Suisse de Zoologie, 1(1): 113-185.
Synonyms: *Dreissena elongata*Locard, 1893
Dreissena elongata Bourguignat, 1893
Habitat: Freshwater.
Distribution: Iraq, Euphrates River (Locard, 1893).

(B) Family: Pholadidae
Aspidopholas tubigera (Valenciennes, 1846)
Original description: *Penitella tubigera* Valenciennes, 1846. Atlas de Zoologia. Mollusques.
Synonyms: *Martesiaobtecta* (G. B. Sowerby II, 1849)
Pholasobtecta G. B. Sowerby II, 1849
Habitat: Marine
Distribution: Iraq, it was recorded as *Aspidopholas obtecta* (Sowerby, 1849) by Yasser *et al*. (2022). Southeastern Thailand (Valentich-Scott and Tongkerd, 2008), Pacific region (Wonc, 1982).

6-Order: Mytilida
Family: Mytilidae
Brachidontes variabilis (Krauss, 1848)
Original description: *Mytilus variabilis* Krauss, 1848. Die Südafrikanischen Mollusken,140 pp.
Synonyms: *Brachidontes semistriatus* (Krauss, 1848)
Mytilus variabilis Krauss, 1848
Habitat: Marine
Distribution: Iraq, it was recorded under the name *Brachyodontes variabilis* (Krauss, 1848) by Ahmed (1975). Indo-Pacific regions (Shin *et al*., 2008), Red Sea and Gulf of Suez (Rusmore-Villaume, 2008).

Limnoperna fortunei (Dunker, 1857)
Original description: *Volsella fortunei* Dunker, 1857. Proceedings of the Zoological Society of London, 24: 358-366.
Synonyms: *Limnoperna coreana* Park &Choi, 2008
Modiola cambodjensis Clessin, 1889
Mytilus martensi Neumayer, 1898
Habitat: Freshwater
Distribution: Iraq (Al-Khafaji *et al*., 2022). China (Xu, 2015).

Lithophaga robusta Jousseaume, 1919
Original description: *Lithophaga robusta* Jousseaume, 1919. *Bulletin du Museum National d Histoire Naturelle*. 25: 252- 257, 344-350.
Habitat: Marine
Distribution: Iraq (Ali *et al*., 2017). Indo-Pacific (Oliver *et al*., 2004).

Mytilus edulis Linnaeus, 1758
Original description: *Mytilus edulis* Linnaeus, 1758. Systema Natura, 10 (ed), 1: 824pp.
Synonyms: *Mytilus abbreviates* Lamarck, 181
*Mytilus borealis*Lamarck, 1819
Mytilus retusus Lamarck, 1819
Habitat: Marine
Distribution: Iraq (Okash *et al*., 2022). Arabian Gulf (Okash *et al*., 2022), and Western Europe (Hilbish *et al*., 2002).

7-Order: Nuculanida
Family: Yoldiidae
Scissileda tropica (Melvill, 1897)
Original description: *Yoldia tropica* Melvill, 1897. Memoris and Proceedings of the Manchester Litterary and Philosophical Society, 41(7): 1-25.
Synonyms: *Yoldia vicina* E. A. Smith, 1906
Habitat: Marine
Distribution: Iraq (Yasser *et al*., 2023). Kuwait (Al-Kandari *et al*., 2020).

8-Order: Ostreida
(A) Family: Isognomonidae
Isognomon legumen (Gmelin, 1791)
Original description: *Ostrea legumen* Gmelin, 1791. Systema Natura, 1(6).
Synonyms: *Isognomon vulsella* (Lamarck, 1819)
Perna caudate Reeve, 1858
Perna spengleri Lynge, 1909
Perna maillardi Deshayes, 1863
Habitat: Marine
Distribution: Iraq (Yasser *et al*., 2022). Mediterranean (Scuderi and Viola, 2019), and Red Sea (Rusmore-Villaume, 2008).

(B) Family: Malleidae
Malleus regula (Forsskål, 1775)
Original description: *Ostrea regula* Forsskål, 1775. Post mortem auctoris edidit Carsten Niebuhr. Hauniae, 1-20, 1-34, 1-164.
Synonyms: *Malleus aquatilis* Reeve, 1858
Malleus decurtatus Lamarck, 1819
Malleus maculosus Reeve, 1858
Habitat: Marine
Distribution: Iraq (Yasser *et al*., 2022).Turkey (Falchi, 1974).

(C) Family: Margaritidae
Pinctada radiata (Leach, 1814)
Original description: *Avicula radiate* Leach, 1814. Zoological miscellany: being descriptions of new or interesting animals. London, vol 1, 2, 3.

Synonyms: *Meleagrina savignyi* Monterosato, 1884
Pinctada imbricata radiata (Leach, 1814)
Habitat: Marine.
Distribution: Iraq, recorded as *Pinctada imbricate radiata* (Leach, 1814) (Yasser *et al*., 2022). Eastern Mediterranean (Doğan and Nerlović, 2008), Red Sea (Rousmore-Villum, 2008).

(D) Family: Ostreidae
Saccostrea cucullata (Born, 1778)
Original description: *Ostrea cucullata* Born, 1778. Index rerum naturalium Musei Caesarei Vindobonensis. Pars I.ma. testacea, (1-40), 1-458, (1-82).
Synonyms: *Saccostrea cucullata* (Born, 1778)
Saccostrea forskahlii (Gmelin, 1791)
Habitat: Marine.
Distribution: Iraq, firstly recorded as *Ostrea* sp. (Mitchell, 1958), later the species recorded under the name *Crassostrea cucullata* (Born, 1778) by Ahmed (1975). Turkey (Çevik *et al*., 2001), Africa (Dye, 1989), Red Sea (Rusmore-Villaume, 2008).

(E) Family: Pinnidae
Pinna bicolor Gmelin, 1971
Original description: *Pinna bicolor* Gmelin, 1971. Systema Natura, 1:6.
Synonyms: *Artina bicolor* (Gmelin, 1971)
Pinna cochlearis H. Fischer, 1901
Habitat: Marine.
Distribution: Iraq (Ali *et al*., 2017). Kuwait (Al-Yamani *et al*., 2012).

9-Order: Pectinida
(A) Family: Pectinidae
Scaeochlamys livida (Lamarck, 1819)
Original description: *Pecten lividus* Lamarck, 1819. Histoire naturelle des animaux sans vertebres, 6(1): 6, 343pp.
Synonyms: *Ostrea tegula* W. Wood, 1828
Pecten lividus Lamarck, 1819
Habitat: Marine.
Distribution: Iraq, it was recorded as *Chlamys lividis* (Lamarck, 1819) by Ali *et al*. (2017). Kuwait (Al-Yamani *et al*., 2012).

(B) Family: Placunidae
Placuna placenta (Linnaeus, 1758)
Original description: *Anomia placenta* Linnaeus, 1758. Systema Natura.(10th ed.). 1:824pp.
Synonyms: *Placenta auriculata* Mörch, 1853
Placenta orbicularis Philipsson, 1788
Ephippium transparens Röding, 1798
Habitat: Marine.

Distribution: Iraq, it was recorded as *Placenta placenta* (Linnaeus, 1758) by (Ahmed (1975). Indo-West Pacific (Mondal *et al*., 2020).

10-Order: Spheriida
Family: Sphaeriidae
Pisidium dubium (Say, 1817)
Original description: *Cyclas dubia* Say, 1817. American edition of the British Encyclopedia, or, dictionary of arts and sciences comprising an accurate and popular view of the present improved state of human knowledge. (1st ed.).
Synonyms: *Cyclas aequalis* Férussac, 1835
Cyclas (*Phymesoda*) *equalis* Rafinesque, 1820
Cyclas (*Pisidium*) *dubium* (Say, 1817)
Habitat: Freshwater.
Distribution: Iraq (Mirza and Nashaat, 2019). Canada, United States (Herrington, 1962).

11-Order: Unionida
Family: Unionidae
Anodonta vescoiana Bourguignat, 1856
Original citation: *Anodonta vescoiana* Bourguignat, 1856. Aménités Malacologiques. 6,255pp.
Synonyms: *Anodonta bahlikiana* Pallary, 1939
Anodonta schlaefliiMousson, 1874
Anodonta vescoiana subsp. *Mesopotamica* Mousson, 1874
Anodonta vescoiana var. *schlaeflii* Mousson, 1874
*Anodonta (Euphrata) bahlikiana*Pallary, 1939
Sinanodonta vescoiana (Bourguignat, 1856)
Habitat: Freshwater
Distribution: In Iraq, it was recorded as *Anodonta bahlikiana* Pallary, 1939 by Pallary (1939), this species is endemic to the Euphrates and Tigris Rivers, Iraq and Turkey (MolluscaBase, 2023). Asia Minor (Kinzelbach, 1989).
Remark: According to the IUCN Red List, this species in Iraq is near threatened of extinction in the near future (Lopes-Lima, 2014).

Leguminaia saulcyi (Bourguignat, 1852)
Original citation: *Unio saulcyi* Bourguignat, 1852.Testacea novissima, (1), 5-31.
Synonyms: *Pseudodon chantrei* Locard, 1883
Unio michonii Bourguignat, 1852
Unio saulcyi Bourguignat, 1852
Habitat: Freshwater
Distribution: Iraq (Harris, 1965). Levant Region (Kinzelbach and Roth, 1984).

Leguminaia wheatleyi (Lea, 1862)
Basionym: *Monocondyloea wheatleyi* Lea, 1862 (original citation not documented according to Molluscabase (2023)).

Synonyms: *Leguminaia mardinensis* (I. Lea, 1865)
Monocondyloea haasii Kobelt, 1914
Habitat: Freshwater
Distribution: Iraq, it was recorded as *Monocondyloea wheatleyi* Lea, 1862 by Lea (1862); Levant Region (Kinzelbach and Roth, 1984).

Potomida semirugata (Lamarck, 1819)
Original citation: *Unio semirugata* Lamarck, 1819. Histoire naturelle des animaux sans vetebres, 6(1): 5, 343pp.
Synonyms: *Potamida delesserti* (Bourguignat, 1852)
Potamida tracheae (Kobelt & Rolle, 1895)
Habitat: Freshwater
Distribution: Iraq, recorded as *Unio salambonia* Lamarck, 1819 by Pallary (1939); Mediterranean Region (Froufe *et al*., 2016).

Pseudodontopsis euphratica (Bourguignat, 1852)
Original citation: *Unio euphratica* Bourguignat, 1852. Testacea novissima, (1), 5-31.
Synonyms: *Pseudodontopsis babylonica* Kobelt, 1913
Unio euphraticus Bourguignat, 1852 by Ahmed (1975)
Habitat: Freshwater.
Distribution: In Iraq, it was recorded under the name *Pseudodontopsis babylonica* Kobelt, 1913 by Pallary (1939). Endemic to the Eastern Mediterranean Regions, in the middle and lower sections of the Tigris and Euphrates basin (Lopes-Lima *et al*., 2021).

Sinanodonta woodiana (Lea, 1834)
Original citation: Symphynota *woodiana* Lea, 1834. Transactions of the American Philosophical Society, 5:23-119, 1-19.
Synonyms: *Anodon castanea* Heude, 1880
Anodon confusa Heude, 1881
Materials examined: Four specimens, Euphrates River, Babylon, October 2021, four specimens, Tigris River, Baghdad, April 2022.
Habitat: Freshwater.
Distribution: In Iraq, this species was recorded by Bogan *et al.* (2021). East and South-East Asia, and introduced to Europe (Popa *et al*., 2007).

Unio crassus Philipsson, 1788
Original citation: *Unio crassus* Philipsson, 1788. Dissertatio historico-naturalis sistens nova testaceorum genera, 4,23pp.
Synonyms: *Unio tiguricus* Servain, 1885
Unio croaticus Drouët, 1881
Unio ehrmanni Kobelt, 1913
Material examined: Two specimens Euphrates River, Babylon, October 2021.
Habitat: Freshwater.

Distribution: Iraq, it was recorded as *Unio ciconius* Kobelt, 1913 by Annandale (1918). Western Palearctic (Araujo *et al*., 2017).

Unio tigridis Bourguignat, 1852
Original citation: *Unio tigridis* Bourguignat, 1852. Testacea Novissima, (1), 5-31.
Synonyms: *Unio calliopsis* Kobelt, 1913
Margaron tigris Lea, 1870
Unio bourguignatianus Lea, 1863
Unio dignatus Lea, 1863
Unio mosulensis Lea, 1863
Habitat: Freshwater.
Distribution: Iraq, it was listed as *Unio calliopsis* Kobelt, 1913 by Annandale (1918). Middle East (Graf and Cummings, 2007).

12-Order: Venerida
(A) Family: Cyrinidae
Corbicula fluminalis (O.F. Müller, 1774)
Original citation: *Tellina fluminalis* O.F. Müller, 1774. Vermivm Terrestrium et Fluviatilum, 1: 1-136.
Synonyms: *Corbicula aegyptiaca* Germain, 1906
Corbicula albeda (Krauss, 1848)
Corbicula artini Pallary, 1902
Materials examined: 30 shells, Canal of Euphrates River, Babylon, November 2021.
Habitat: Freshwater.
Distribution: Iraq (Ahmed, 1975).Wide range in Africa, Asia, Europe, North America, and South America (Freitas, 2010).

Corbicula fluminea (O.F.Müller, 1774)
Original citation: *Tellina fluminea* O.F. Müller, 1774.Vermivm Terrestrium et Fluviatilum, 2: 1-36, 1-214.
Synonyms: *Corbicula aquiline* Heudo, 1880
Corbicula astronomoca Heudo, 1880
Corbicula cheniana Heudo, 1880
Materials examined: Four specimens, Al-Dalmaj Marsh, April 2023.
Habitat: Freshwater.
Distribution: Iraq (Ahmed, 1975). Eastern Asia, South America, North America, and Europe (Crespo *et al*., 2015).

(B) Family: Mactridae
Mactra dissimilis Reeve, 1854
Original citation: *Mactra dissimilis* Reeve, 1854. Conchologia Iconica, 8:1-21.
Synonyms: *Mactra lilacea* Lamarck, 1818
Mactra dissimilis Deshayes, 1855
Habitat: Marine.

Distribution: Iraq (Ahmed, 1975). Australia (Reeve, 1854), and Singapore (Wong, 2009).

(C)Family: Trapezidae

Neotrapezium sublaevigatum (Lamarck, 1819)

Original citation: *Cardita sublaevigata* Lamarck, 1819. Histoire naturelle des animaux sans vertebres, 6(1): 6, 343pp.

Synonyms: *Cardita sinuosa* Potiez & Michaud, 1844 ·
Cardita sublaevigata Lamarck, 1819 ·
*Cypricardia solenoids*Reeve, 1843 ·
Cypricardia vellicata Reeve, 1843 ·
Libitina sublaevigata Lamarck, 1819 ·
Petricola esculpturata Preston, 1915 ·
Trapezium sublaevigatum (Lamarck, 1819) ·

Habitat: Marine.

Distribution: Iraq (Yasser *et al*., 2022). Singapore (Tan and Low, 2013), and Hong Kong (Morton, 1979).

(D)Family: Veneridae

Callistaum bonella (Lamarck, 1818)

Original citation: *Cytherea umbonella* Lamarck, 1818. Histoire naturelle des animaux sans vertebres, 612pp.

Synonyms: *Amiantis umbonella* (Lamarck, 1818)
Cytherea isselina Jousseaume, 1888
Meretrix umbonella (Lamarck, 1818)

Habitat: Marine.

Distribution: Iraq, it was recorded as *Macrocallista umbonella* by Ahmed (1975). Northwest and south-east of the Persian Gulf and the Sea of Oman (Saeedi *et al*., 2010).

Circenita callipyga (Born, 1778)

Original citation: *Venus callipyga* Born, 1778. Index rerum naturalism Musei Caesarei Vindobonensis. Testacea, (1-40), 1-458.

Synonyms: *Circe crachrodii* Gray, 1838
Circe fumata Reeve, 1863
Cytheraea elliptica G. B. Sowerby II, 1851

Habitat: Marine

Distribution: Iraq (Yasser *et al*., 2023). Kuwait and Arabian Gulf (Al-Kandari *et al*., 2020).

Marcia cordata (Forsskål, 1775)

Original citation: *Venus cordata* Forsskål, 1775.Post mortem auctoris edidit Carsten Niebuhr. Hauniae. 1-20.

Synonyms: *Marcia flammea* (Gmelin, 1791)
Tapes Kraussi Reeve, 1864
Venus flammea Gmelin, 1791

Habitat: Marine.

Distribution: Iraq (Yasser *et al*., 2022). Kuwait (Al-Kandari, 2020).

Pelecyora katiawarensis (Fischer-Piette and Métivier, 1971)
Basionym: *Dosinia katiawarensis* Fischer-Piette and Métivier, 1971(original name not documented according to Molluscabase (2023)).
Synonym: *Dosinia katiawarensis* Fischer-Piette and Métivier, 1971
Habitat: Marine
Distribution: Iraq (Yasser *et al*., 2022). Western Pacific, China, Taiwan, and Philippines (Bernard *et al*., 1993).

Periglypta reticulata (Linnaeus, 1758)
Original citation: *Venus reticulata* (Linnaeus, 1758). Systema Naturae. (10th ed.). 1: 824pp.
Synonyms: *Antigona reticulate* (Linnaeus, 1758)
Chione reticulate (Linnaeus, 1758)
Habitat: Marine.
Distribution: Iraq (Yasser *et al*., 2022). South Pacific (Paulay, 1987).

Placamen lamellatum (Röding, 1798)
Original citation: *Venus lamellata* Röding, 1798. Museum Boltenianum sive Catalogus cimeliorum e tribus regins naturae quae olim collegerat Joa, 8, 199pp.
Synonyms: *Bassina javana* Kotaka, 1977
Placamen tiara (Dillwyn, 1817)
Venus lamellate Röding, 1798
Habitat: Marine.
Distribution: Iraq (Yasser *et al*., 2022). India (Joshi *et al*., 2018).

Protapes cor (G. B. Sowerby II, 1853)
Original citation: *Venus cor* G. B. Sowerby II, 1853. Thesaurus conchyliorum or monographs of genera of shells, 2(14): 703-739, 152-162.
Synonyms: *Paphia* (*Protapes*) *cor* (G. B. Sowerby II, 1853)
Paphia cor (G. B. Sowerby II, 1853)
Tapes cor (G. B. Sowerby II, 1853)
Venus cor G. B. Sowerby II, 1853
Habitat: Marine.
Distribution: Iraq (Yasser *et al*., 2023). Arabian Gulf (Oliver and Glover, 1996), India, and Pakistan (Ramakrishna, 2010).

Protapes ziczac (Linnaeus, 1758)
Original citation: *Venus ziczac* Linnaeus, 1758. Systema natura. (10th ed.). 1:824pp.
Synonyms: *Tapes inflata* Römer, 1870
Venus ziczac Linnaeus, 1758
Habitat: Marine.
Distribution: Iraq (Yasser *et al*., 2022); Indian Ocean including Red Sea, Madagascar, East Africa, Oman, and Persian Gulf (Arathi *et al*., 2018).

Sunetta effossa (Hanley, 1843)
Original citation: *Cytherea effosa* Hanley, 1843. Proceedings of the Zoological Society of London, 10: 122-132.
Synonyms: *Sunetta effossa Var. semisulcata* Fischer-Piette&P.-H. Fischer, 1939.
Habitat: Marine.
Distribution: Iraq (Yasser *et al*., 2023).Thailand (Wells *et al*., 2021).

Timoclea arakana (Nevill & Nevill, 1871)
Original citation: *Cryptogramma arakana* Nevill & Nevill, 1871. The Journal of the Asiatic Society of Bengal, part2, 40(1):1-11.
Synonyms: *Timoclea farsiana* Biggs, 1973
Timoclea lavrani Fischer-Piette, 1974
Venus arakana Nevill & Nevill, 1871
Habitat: Marine.
Distribution: Iraq (Yasser *et al*., 2022). Iran (AminiYekta *et al*., 2014).

DISCUSSION

The results of the current study generally show that Iraq has a diverse malacofauna distributed in its diverse aquatic environment, and as indicated by this study the freshwater environment has much fewer species (14 species) than the marine one (37), probably this is due to fewer surveys and studies concerned with freshwater bivalve in the region. The most prevalent family was Unionidae with eight species, then Arcidae with five species.

Compared the number of Iraqi bivalve species with these listed of neighboring countries100 species in Al-Kuwait state (Al-Kandari *et al*., 2020), 57 marine species in Iran (Paphan and Ghajari, 2018), 40 freshwater species in Turkey (Gürlek *et al*., 2019) and 279 marine species in Turkey (Öztürk *et al*., 2014) revealed much less diversity among these species probably due to differences in the nature of the Iraqi aquatic environments.

CONCLUSIONS

The current list, as compared with previous studies about Bivalvia in Iraq considered the first study that gives us a comprehensive overview of the bivalves (freshwater and marine) recorded in Iraq over time. The distribution of bivalvia species and their current systematic situation were demonstrated. During the preparation of this list, all bivalvia studies conducted in Iraq up to the present time were taken into account, including both old and recent studies.

Among the 25 documented families of bivalvia in Iraq the family Unionidae is the most studied in Iraq. Some old records of species needed to be emphasized, so more work on bivalve species must be done in different ecologies of marine and freshwater of Iraq to emphasizing the validity of the recorder species, and for the possibility of more species existence.

CONFLICT OF INTEREST STATEMENT

"The author has no conflicts of interest to declare".

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قائمة مرجعية لقواقع ثنائية الصدفة Bivalvia (Mollusca) في العراق

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تأريخ الاستلام: 2023/2/22، تأريخ القبول: 2023/6/30، تأريخ النشر: 2023/12/20

الخلاصة

قدمت الدراسة الحالية قائمة شاملة لأنواع محار المياه العذبة والمالحة، تم تسجيل 51 نوعا موزعة على النحو التالي: 14 نوعا من أنواع المياه العذبة و 37 نوعا من الأنواع البحرية، تعود هذه الأنواع إلى 25 عائلة مع جميع الملاحظات المتوفرة عن توزيعها وتصنيفها وتسميتها. تضمنت هذه الدراسة العينات التي تم جمعها فضلا عن الأنواع التي سبق دراستها وتسجيلها للعراق.