

First Record of *Melanopsis buccinoidea* (Olivier, 1801) (Gastropoda: Melanopsidae) from Al-Gharraf River, Southern Iraq

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Abstract

Along Al-Gharraf River, freshwater snail *Melanopsis buccinoidea* (Olivier, 1801) samples were collected. The collected sites located within the districts of (Al-Nasr, Al-Rifa'i, Qalat Sukkar, and Al-Fajr), Dhi Qar governorate, southern Iraq. The collection period was from July to September 2025. The specimens were identified by the shape of the snail's shell as well as the morphometric features. The shells are elongated-conical, its surface is smooth, shell's colour is chestnut to dark-brown in, dextrally coiled, with an oval aperture and a prominent operculum. Shell height and width, aperture height and width supported the species identification. This research represents the first record of *M. buccinoidea* in Al-Gharraf River area, expanding the known zone of the species in Iraq. The findings enhance understanding of freshwater gastropod diversity in Iraq and serve as a baseline for future taxonomic, ecological, and molecular research.

Keywords: *Melanopsis buccinoidea* (Olivier, 1801); freshwater snails; Gastropoda; Al-Gharraf River.

أول تسجيل للقوقع (*Melanopsis buccinoidea* (Olivier, 1801)

(Gastropoda: Melanopsidae) من نهر الغراف، جنوب العراق

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الخلاصة

جمعت عينات من قوقع المياه العذبة (*Melanopsis buccinoidea* (Olivier, 1801) من أربعة مواقع على امتداد نهر الغراف (أفضية النصر، والرفاعي، وقلعة سكر، والفجر) في محافظة ذي قار، جنوب العراق، خلال المدة من تموز إلى أيلول 2025. شُخصت العينات المجمعة بالاعتماد على الصفات المورفولوجية والمورفومترية للصدفة. وتميزت الصدفة بشكلها المخروطي المستطيل، وسطحها الأملس، ولونها الذي تراوح بين البني والبني الكستنائي الداكن، مع التفاف يميني، وفتحة بيضوية، وغطاء صدف (Operculum) متطور. كما أخذت القياسات المورفومترية التي شملت ارتفاع الصدفة، وعرضها، وارتفاع الفتحة، وعرض الفتحة لدعم التشخيص التصنيفي للنوع. تؤثّق هذه الدراسة أول تسجيل للنوع *M. buccinoidea* في نهر الغراف، مما يوسع نطاق توزيعه المعروف داخل العراق. وتمثّل هذه النتيجة إضافة مهمة إلى معرفة تنوع بطنيات القدم العذبة في العراق، كما توفر أساساً مرجعياً للدراسات التصنيفية والبيئية والجزئية المستقبلية.

1. Introduction

The Mollusca phylum considered as the second-largest group in the kingdom of animal, with Gastropoda being it's the most diverse class. Freshwater snails, globally that have around 86,600 known snail species, are crucial for nutrient cycling, organic matter reproduce, and food-chain interactions. They are also essential bioindicators of aquatic ecosystem and environmental health [1]; [2]; [3]; [4]; [5]. Notably, the Melanopsidae family includes the genus *Melanopsis*, that is widespread across and within the Mediterranean Basin, the Middle East, and Western Asia. These species illustrate significant and large morphological diversity and inhabit various freshwater environments, Thus, they are considered key subjects for ecological and taxonomic studies [6]; [7]. Research on *Melanopsis* in Iraq started in the beginning of the 20th century, with well-documented records from Mesopotamia [8]. Followed by studies refined the taxonomy and diversity of Iraqi *Melanopsis*, though *M. buccinoidea* remained unrecorded and missed for many years. Central and southern regions of Iraq were where the first verified sighting of *M. buccinoidea*, expanding its known distribution within Iraq [9]. Ecological and environmental studies subsequently insured its presence in sulfur-springs and freshwater territories in Province of Karbala with many locations in the Province of Maysan [10]; [11]; [12].

In spite of these contributions of *M. buccinoidea* in Iraq which considered very valuable information, the reported and conformed distribution of *M. buccinoidea* remains incomplete. Since presence of several major and big river, such as Al-Gharraf River, lack recorded occurrences. Updating the distribution data of freshwater mollusks is very important, considering the ongoing environmental and ecological changes impacting and effected Iraqi aquatic and hydrological ecosystems. This study reports the first record and register of *M. buccinoidea* from Al-Gharraf River in Thi-Qar Province, south of Iraq. This study also offers rich morphological description details of the collected and examined specimens, characterizes their biological habitat, as well as discusses the importance of this new approach of recording and reporting within the global and whole recording of the species' known distribution in Iraq and neighboring areas.

2. Materials and Methods

Twenty-two adult snail specimens were collected during a period extended from July to September 2025 at four collecting stations along the River of Al-Gharraf as shown in Table 1. They were collected manually and randomly using a 40-inch dredging net to sample submerged vegetation and unreached areas. The specimens were then transported in labeled plastic to the laboratory, water from the snail's original habitats were added to the containers, in addition to the aquatic vegetation. To ensure proper aeration during transit, the containers were covered with perforated lids. In the laboratory, specimens were carefully cleaned with a soft brush to remove any impurities such as sediment. The identification of the snails was according to shell morphological features (shape, spire,

whorls, sutures, aperture, operculum, and umbilicus), following the taxonomic criteria and keys from [13]; [14], [15]; [16], [17]. Morphometric measurements (shell height (SH) and width (SW), aperture height (AH) and width (AW), were taken using a digital caliper (0.01 mm accuracy) [13].

Table 1- Coordinates of the study stations

Station's name	Station's coordinates
Al-Nasr District	(31°32' N, 46°07' E)
Al-Rifa'i District	(31°43' N, 46°06' E)
Qalat Sukkar District	(31°51' N, 46°04' E)
Al-Fajr District	(31°54' N, 45°57' E)

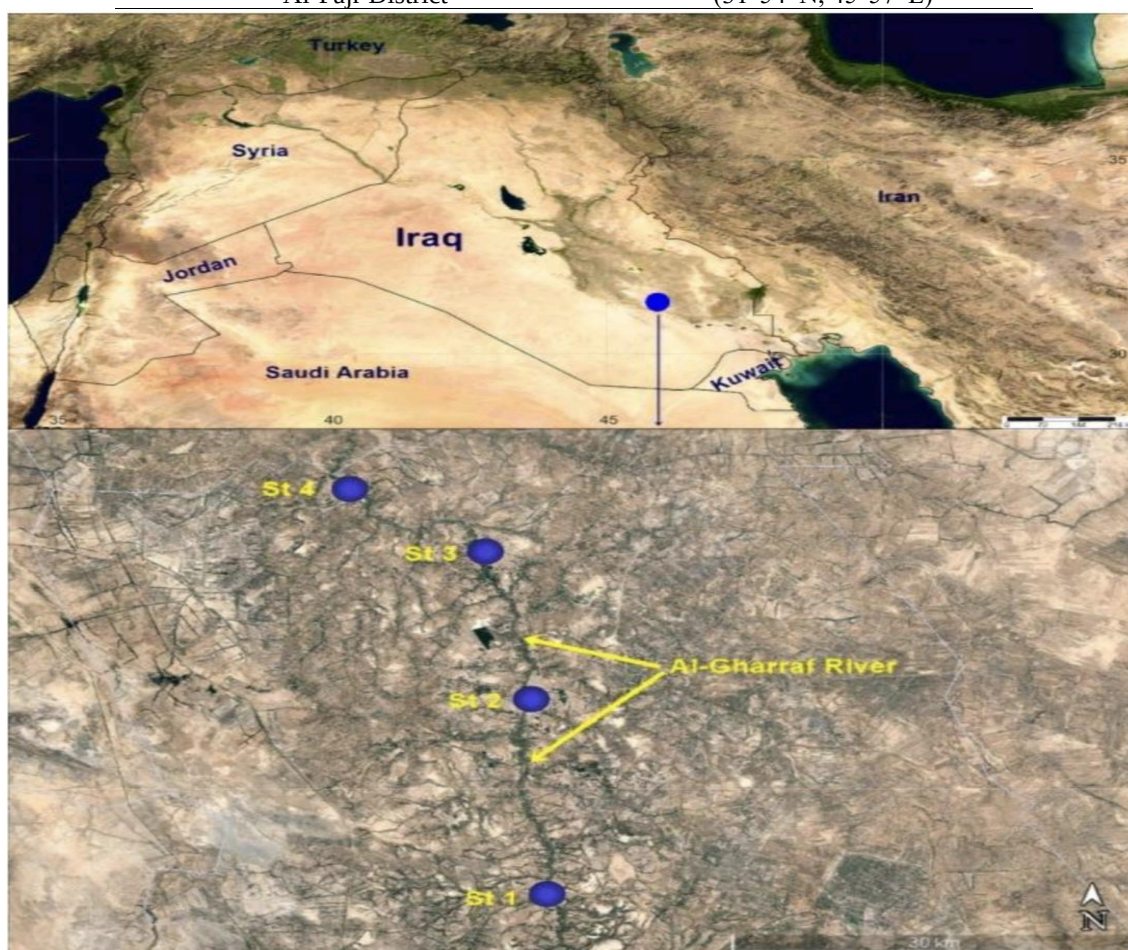


Figure-1 Shows the locations of study areas.

3. Results

3.1 Taxonomy

Kingdom: Animalia

Phylum: Mollusca

Class: Gastropoda

Subclass: Prosobranchia

Order: Mesogastropoda

Family: Melanopsidae

Genus: *Melanopsis*

Species: *Melanopsis buccinoidea* (Olivier, 1801)

3.2 Shell Description

The specimens of the studied *M. buccinoidea* have a small to medium, elongated conical shell with a clear right-handed coiling with a smooth shale surface (Figure 2). The shell is lacking notable sculpture with a varied color from chestnut to dark brown. Studied snail's shells have minor differences. The spire was moderately raised, composed of about four whorls divided by shallow sutures. The apex was relatively flat and often eroded in adult samples.

The aperture was oval, covering about one-third of the shell's height. The outer lip was smooth, and the well-developed columella was prominent. The shell lacked an umbilicus and was sealed by a horny, oval operculum. Additionally, a well-formed siphostome appeared at the basal part of the aperture, serving as one of the species' key diagnostic features (Figure 2).

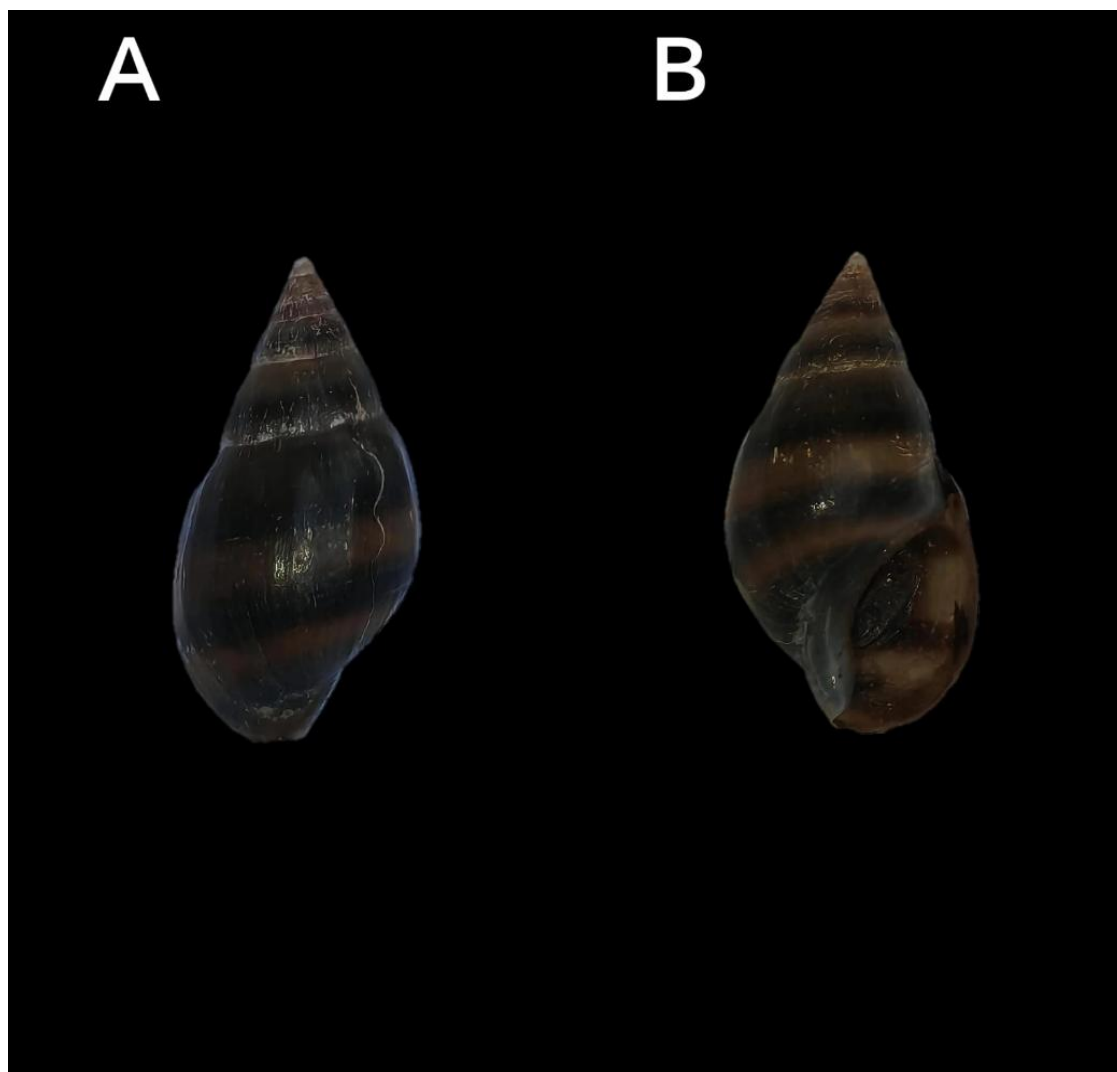


Figure -2 *M. buccinoidea* collected from Al-Gharraf River

3.3 Measurements

A total of 22 adult specimens of *M. buccinoidea* were examined for shell morphometric analysis. Four shell parameters were measured, including Shell height (SH), Shell width (SW), Aperture height (AH) and Aperture width (AW) Table 2.

Table 2- Shell morphometric measurements of 22 specimens of *M. buccinoidea* collected from the Gharraf River, Dhi Qar Province, Iraq.

Sample	Shell height (SH) (mm)	Shell width (SW) (mm)	Aperture height (AH) (mm)	Aperture width (AW) (mm)
1	23.8	11.3	12.4	6.8
2	24.5	11.7	12.9	7.0
3	25.1	12.0	13.3	7.2
4	24.7	11.6	13.0	7.1
5	25.4	12.1	13.5	7.3
6	24.2	11.5	12.7	6.9
7	25.0	11.9	13.2	7.2
8	24.9	11.8	13.1	7.1
9	25.1	11.7	13.3	7.4
10	24.3	12.2	13.4	7.0
11	25.0	12.1	13.2	7.2
12	24.8	11.5	12.7	7.6
13	25.2	11.9	13.1	7.1
14	25.0	12.3	13.5	7.3
15	24.7	11.8	13.6	7.4
16	25.3	12.4	13.4	7.0
17	25.1	12.1	13.2	7.2
18	24.8	11.6	13.0	6.9
19	25.2	12.0	13.1	7.4
20	24.9	11.7	13.3	7.1
21	25.4	11.6	13.4	7.3
22	25.6	11.9	13.5	7.2
Mean	24.91	11.85	13.17	7.17
(mm)				
SD	0.43	0.28	0.30	0.19
(mm)				

4 Discussions

4.1 Distribution and Habitat

M. buccinoidea has a broad range in the Middle East region, found in freshwater territories and habitats across many countries such as Jordan, Syria, Saudi Arabia and Turkey [18]; [19]; [17], [20]. These findings show the species' adaptability and living

flexibility to different aquatic and hydro-environments e.g. rivers, streams, creeks, springs, agricultural irrigation canals, as well as ponds, indicating its ecological versatility and wide geographic distribution and presence. In Iraq, data on *M. buccinoidea* distribution has a shortage are limited. Previous researches identified this snail type in provinces such as Karbala and Maysan, where its presence was linked to freshwater habitats with a limited abundance according to many ecological factors [10], [11]. Its presence in central and southern Iraq was confirmed by molecular and morphological studies, also revealing its role as an intermediate host for trematode parasites [9]. This study reports, as a first record, the presence of *M. buccinoidea* in Al-Gharraf River in northern Dhi Qar Governorate, with specimens collected from all four station sites, indicating a well-established population along this river. This new record helps fill part of the distribution gap in southern Iraq and enhances understanding of the species' range in the country. The species' presence in Al-Gharraf River aligns with earlier findings that it inhabits permanent freshwater systems with appropriate substrates and aquatic vegetation [10]; [18]; [20]. Overall, this record broadens the known distribution without challenging its ecological preferences.

5-Conclusion

This study reports and registers the first record of *M. buccinoidea* in Al-Gharraf River in the Governorate of Dhi Qar, south of Iraq, thereby expanding the species' known range of its distribution within this country. The specimens' morphological features align with earlier descriptions from samples from neighbor and close regions. This finding enhances current knowledge of freshwater gastropod distribution in Iraqi and underscores the need for further surveys and investigations of underexplored Iraqi's river systems. Future research should integrate molecular analyses with morphological data for better understanding of the taxonomic relationships and genetic diversity of *Melanopsis* populations in Iraq.

Acknowledgements

Researchers of this study show their big appreciations to all staff in the Department of Science laboratory, College of the Basic Education, University of Sumer for their efforts and assistances.

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