



First Record and Southern Range Expansion of *Rumina decollata* (Linnaeus, 1758) (Gastropoda: Subulinidae) in Iraq

Intisar M. A. Jabbar*, Tariq H.Y. Al-Maliky, Amal S. Al-Sheraa, Mahmood S. Hashim and Aqeel A.A. Al-Waeli

Marine Science Centre, University of Basrah, 61004, Basrah, Iraq

*Corresponding author: intesar.jabbar@uobasrah.edu.iq

Abstract

We provide the first confirmed record of the decollate snail, *Rumina decollata*, from Basrah City, southern Iraq. The specimens were obtained from a semi-urban garden habitat and identified using key morphological characteristics: the decollate (truncated) spire and the elongate, cylindrical shell. Morphometric analysis of 30 adult specimens revealed a mean shell length of 29.36 mm, a mean width of 10.77 mm, and a total mean weight of 1.87 g. This record extends the known distribution of *R. decollata* to the southernmost extent of Iraq and complements previous records from Diyala and the Middle Euphrates region. *Rumina decollata* has been introduced from the Mediterranean as a predatory species and a potentially invasive species, and may threaten the native land snail community structure. These data serve as a reminder to further monitor on a broader scale, conduct genetic analysis, and evaluate ecological risk assessment on pathways of introduction, establishment and potential impact across terrestrial ecosystems of Iraq.

Keywords:

Diversity, Gastropod, Snail, Southern Iraq.

How to cite: Jabbar, I., Al-Maliky, T., Al-Sheraa, A., Hashim, M., & Al-Waeli, A. (2025). First Record and Southern Range Expansion of *Rumina decollata* (Linnaeus, 1758) (Gastropoda: Subulinidae) in Iraq. *GPH-International Journal of Biological & Medicine Science*, 8(7), 45-54. <https://doi.org/10.5281/zenodo.17019273>



This work is licensed under Creative Commons Attribution 4.0 License.

Introduction

Land snails are important members of terrestrial ecosystems, involved in nutrient cycling, soil formation and food webs (Martin & Sommer, 2004). One example of a land snail is the decollate snail *Rumina decollata* (Linnaeus, 1758), a predatory land snail from the Mediterranean area that belongs to the family Subulinidae (Reyna & Gordillo, 2018; Rau *et al.*, 2022; Al-qaisi & Farman, 2023).

Rumina decollata is well-known as a carnivorous land snail from the Mediterranean area, as it has also been widely introduced to the Americas, Africa and parts of Asia, as a biological control agent of pest gastropods. Given their predation on eggs and juveniles of other terrestrial snails and slugs, it has the potential to contribute to invasive populations of mollusca, especially in agricultural systems such as citrus orchards. In Türkiye, populations of *Eobania vermiculata* have been effectively reduced, but worries remain that they may impact native members of terrestrial ecosystems and have ecological ramifications (Ekin, 2025). Although laboratory studies have indicated that it preys on juvenile snails less than roughly 13 mm, they do actively consume plant material, raising questions about their effectiveness as control agents (Mc Donnell *et al.*, 2016). Observations in Argentina confirm its ongoing spread and introduction from multiple source populations, supporting its adaptability to new environments (Rau *et al.*, 2022). Historical studies from the U.S. further document its life cycle and seasonal activity, reinforcing its ability to establish in diverse climates (Batts, 1957).

The species has an elongate, decollate shell that generally ranges from 25–35 mm and has a truncate apex (Batts, 1957). *R. decollata* is highly adaptable to anthropogenic habitats, including gardens, agricultural areas, and urban greenery. The opportunities for *R. decollata*, as a biocontrol agent, have been highlighted in various countries, but we must also consider the potential impact on native fauna of gastropods, particularly outside of its range, where it might be non-native (De Francesco & Lagiglia, 2007).

Rumina decollata in central and northeastern Iraq has been noted in some previous work. Al-Qaisi and Farman (2023) first documented *R. decollata* from Diyala Governorate in the northeast; whilst Ghulam (2025) noted its presence from Najaf, Karbala, and Diwaniya in the Middle Euphrates region. With this information, as well as the present record in Basrah, we can confidently denote that it has been moving quickly through the varying ecotypes of Iraq with great ease.

Despite increasing knowledge of the diversity of terrestrial molluscs in Iraq, including (Al-Maliky *et al.*, 2022; Naser, *et al.*, 2024; Al-Maliky, *et al.*, 2024a,b), there are no records of *R. decollata* until now. Recent records confirmed the occurrence of the species in central and northeastern Iraq (Al-Qaisi & Farman, 2023; Ghulam, 2025). However, no prior records have been published from southern Iraq.

This study documents the first confirmed occurrence in Basrah City, evaluating its morphology, morphometrics, and discussing possible invasion mechanisms and risks.

Materials and Methods

Study Area and Sampling

Field surveys were conducted in Basrah City, located in southern Iraq during April 2025 (Fig. 1). Specimens of terrestrial snails were collected manually from garden soils and beneath leaf litter in residential and semi-urban green areas. The habitat was characterized by moist, shaded conditions with ornamental vegetation and organic debris—favorable for terrestrial mollusks.

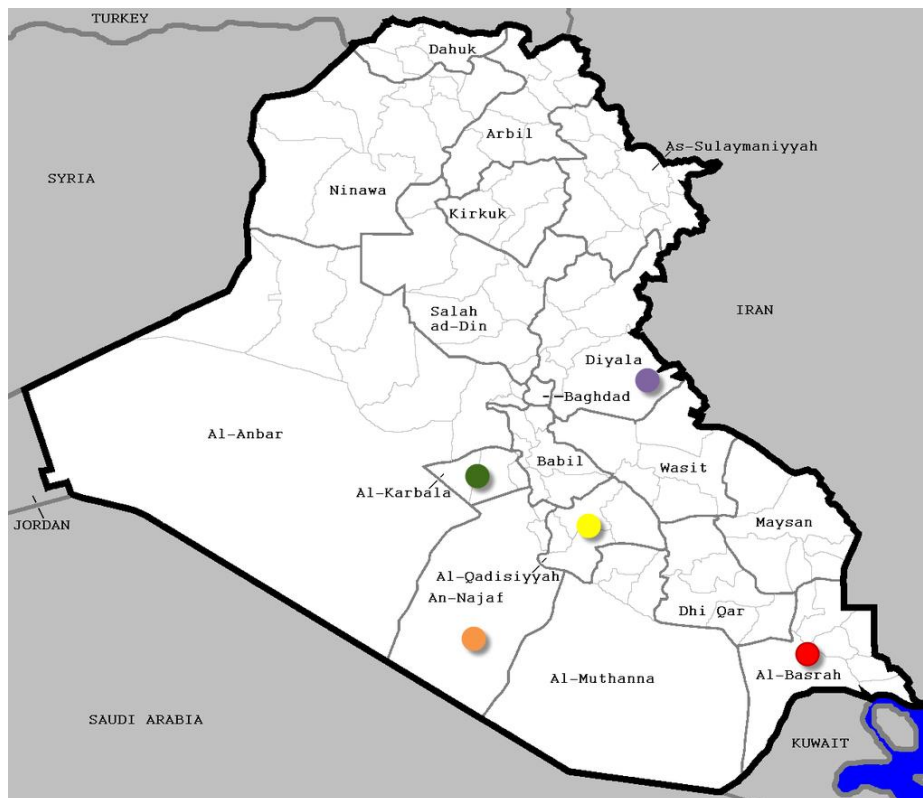


Figure 1. Map showing the distribution of *Rumina decollata* in Iraq.

Specimen Collection and Preservation

Live individuals of *Rumina decollata* were handpicked and placed in aerated plastic containers with moist paper to prevent desiccation. Specimens were transported to the laboratory at the Marine Science Centre, University of Basrah, where they were cleaned and examined. Only adult individuals with fully developed apertures and truncated apices were used for morphometric measurements.

Morphological Identification

Identification of the species was made following Batts (1957) and Rau et al. (2022). Key characteristics included the truncated (decollate) apex, elongate cylindrical shell, and thickened aperture lip.

Morphometric Measurements

A total of 30 adult specimens were measured using a digital caliper (accuracy ± 0.01 mm) and an electronic balance (accuracy ± 0.01 g). The following shell parameters were recorded for each individual: Total shell length (mm), Maximum shell width (mm), Aperture length (mm), Aperture width (mm) and Total weight (g).

Data Analysis

Descriptive statistics (mean, standard deviation, minimum, and maximum) were calculated for each morphometric trait using Microsoft Excel and R software. Boxplots were generated to visualize trait variability.

Results

Taxonomic

Gastropoda Cuvier, 1795

Stylommatophora A. Schmidt, 1855

Achatinidae Swainson, 1840

Rumininae Wenz, 1923

Rumina Risso, 1826

Rumina decollata (Linnaeus, 1758)

Morphological Observations

All collected specimens exhibited diagnostic characteristics of *Rumina decollata*, including an elongate cylindrical shell with a decollate (truncated) apex, a slightly striated surface, and an obliquely oval aperture with a thickened peristome. The coloration ranged from light to dark brown, with some individuals showing faint banding (Fig. 2).



Figure 2. *Rumina decollata* (Linnaeus, 1758) collected from Basrah City, southern Iraq.

Morphometric Analysis

A total of 30 adult individuals were measured. Summary statistics for the five shell parameters are presented in Table 1.

Table 1. Descriptive statistics of *Rumina decollata* specimens from Basrah City (n = 30).

| Trait | Minimum | Maximum | Mean | Standard Deviation (SD) |
|----------------------|---------|---------|-------|-------------------------|
| Shell Length (mm) | 24.87 | 35.38 | 29.36 | 2.41 |
| Shell Width (mm) | 9.06 | 12.36 | 10.77 | 0.79 |
| Weight (g) | 1.04 | 2.98 | 1.87 | 0.48 |
| Aperture Length (mm) | 7.67 | 12.40 | 10.56 | 1.04 |
| Aperture Width (mm) | 4.79 | 8.80 | 6.63 | 1.01 |

Boxplots (Fig. 3) revealed moderate variation in shell length and aperture dimensions, while weight exhibited the highest inter-individual variability, suggesting differences in age

or nutritional condition.

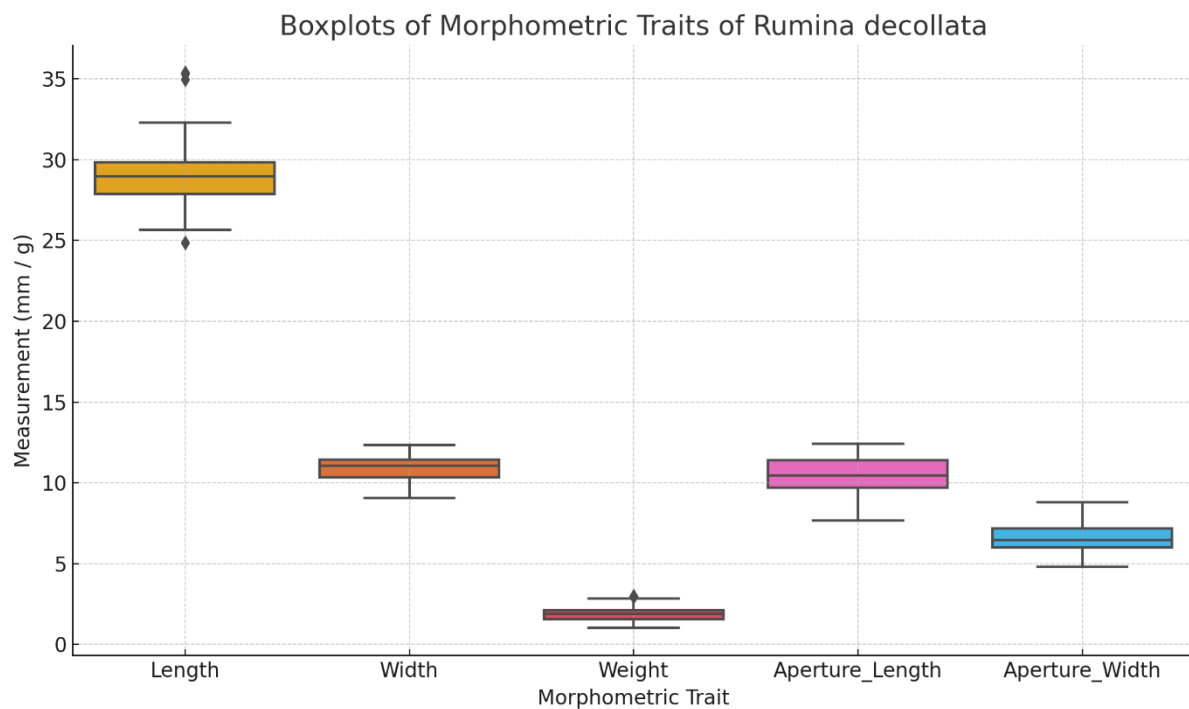


Figure 3. Showing the boxplots of morphometric traits in *Rumina decollata*.

Discussion

This study documents the first confirmed record of *Rumina decollata* in Basrah City, southern Iraq, thereby expanding the known range of this species into the Mesopotamian region. The morphological characteristics observed particularly the decollate shell structure, cylindrical body form, and thickened aperture are consistent with descriptions in global literature (Batts, 1957), confirming species identity. The morphometric analysis revealed relatively low inter-individual variation, especially in shell length and width, suggesting a morphologically stable population possibly originating from a limited founder group.

Comparing the Basrah population with those from Diyala and the Middle Euphrates reveals both morphological stability and ecological plasticity. For instance, while the Najaf population displayed slightly larger average shell lengths (up to 31 mm; Ghulam, 2025), the Basrah population remained within typical size ranges (mean 29.36 mm). This suggests either localized environmental filtering or founder effects, depending on introduction pathways. Additionally, the species has now been recorded across agricultural, semi-urban, and loamy habitats, confirming its ecological versatility and potential invasiveness. Fig 1 including previous records from Diyala Al-Qaisi and Farman (2023) (purple), Al-Qadisiyyah (yellow), Najaf (orange), and Karbala (green) Ghulam, 2025, as well as the present record from Basrah City (red). Fig. 2 The shell displays diagnostic features including the truncated (decollate) apex, elongate cylindrical form, and obliquely oval aperture with a thickened lip. Left: apertural view; Right: dorsal view. Fig. 3 Key observations include: Shell length and width display a relatively tight distribution, suggesting consistent growth patterns among individuals. Aperture dimensions (length and width) are more variable, indicating potential

differences in age, sexual maturity, or environmental influence. Weight exhibits the highest variation, likely due to physiological differences (e.g., hydration level, reproductive stage).

Rumina decollata has been purposefully released to places like U.S. (California), Türkiye, and Argentina for biological control of pest gastropods. While it is effective at controlling specific pest populations, it may also create ecological effects, and it is important to manage and assess, that predatory effectiveness may be limited and should be viewed on a case-by-case basis and relative to the region (Mc Donnell *et al.*, 2016; Ekin, 2025; Reyna & Gordillo, 2018). *Rumina decollata* is an opportunistic predator, feeding upon the eggs and juveniles of other terrestrial gastropods regardless of them being endemic or vulnerable. The introduction of *R. decollata* into new habitats opens up many ecological challenges concerning the species predation or competition with an existing species altering the composition of native mollusk communities (Ekin, 2025). For example, in Argentina, they show that *R. decollata* invades arid and semi-arid areas where they may especially disrupt fragile habitats contributing to biodiversity reduction (de Francesco & Lagiglia, 2007). Thus, *R. decollata* establishing in Basrah has the potential to threaten native land snail biodiversity - particularly in fragile or isolated habitat. This record also represents only the second confirmed record of an invasive land snail species with an established record in Basrah City. The first was made known by Al-Khafaji *et al.* (2016) when they reported the occurrence of *Eobania vermiculata* (O.F. Müller, 1774) in the Hareer and Al-Khora regions of Basrah. Both were introduced species which may have impacts on native gastropod communities and agricultural systems. The successive record of *E. vermiculata* and *R. decollata* in less than a decade indicate the south of Iraq continues to become vulnerable to biological invasions, likely from anthropogenic disturbances and the movement of soil and plant materials which are not carefully tracked.

While the pathway of introduction is not known, given data showing a globally widespread distribution and association with anthropogenic disturbed habitats, the unintentional introduction into Basrah City may have arrived via landscaping activities, imported soil, or as an ornamental plant. Many studies have shown that the ornamental plant trade represents a major pathway for the translocation of non-native invertebrates, including gastropods and insects (e.g. Dehnen-Schmutz & Touza, 2008; Drew *et al.*, 2010). The impacts of global trade networks can act in a way that allows for the translocation of alien species that may be able to circumvent local ecological barriers to become established in novel environments (Rodríguez *et al.*, 2024).

Furthermore, the capacity of *R. decollata* to adapt to dry and disturbed habitats leaves potential for invasive risk, especially when introduced accidentally or sympatrically to its preferred area through human commerce. This concern is present within the recent analyses that noted the importance of biosecurity to pre-emptively deal with biological invasion due to international commerce (Epanchin-Niell *et al.*, 2021).

Conclusion

This study provided the first report of the decollate snail, *Rumina decollata*, from Basrah City (southern Iraq). The morphological and systematic identification and the morphometrics noted indicate the presence of a stable population. The introduction was most likely anthropogenic. The species is a known predator and can survive in a range of environmental conditions. As a result, the introduction of *R. decollata* is concerning since it may have an impact upon the native land snail fauna. This report is a good example of the importance of identifying and monitoring terrestrial snail communities in Iraq, particularly urban and horticultural areas, at which to alert biological invasions. More investigations, including genetics and ecological interactions, are necessary to assess the origins of the introduced *R. decollata*, its processes and dynamics of invasion, and effects on biodiversity and indigenous species. In this paper, and along with recent reports from Diyala and the Middle Euphrates area, we have confirmed the rapid establishment of *Rumina decollata* across a broad spectrum of ecological zones in Iraq. The impacts of *R. decollata* on native mollusk diversity and a national monitoring framework for land snail invasions is urgently needed and need to be discussed.

Acknowledgments

We would like to express our sincere gratitude and appreciation to Professor Dr. Murtadha Nasser Dabij for his valuable contribution to this research, particularly in the classification, and for providing us with essential resources.

References

- Al-Khafaji, K. K. S., Abud-Sahab, A. M., & Aziz, N. M. (2016). First record of terrestrial snail *Eobania vermiculata* (O.F. Müller, 1774) (Gastropoda: Helicidae) from Basrah areas, Iraq. *Arthropods*, 5(3): 125–129.
- Al-Maliky, A.M.J., Al-Maliky, T.H.Y. & Al-Khafaji, K.K.S. (2022). Ecological study of two gastropods species *Melanoides turbuculata* and *Melanopsis preamorsa* from Euphrates river - Basrah, Iraq. *Journal of Applied and Natural Science*, 14(4), 1119 - 1123. <https://doi.org/10.31018/jans.v14i4.3585>.
- Al-Maliky, T.H.Y., Al-Sheraa, A.S., Hashim, M.S., Hanan A.Z. Salbok, H.A.Z. & Zine, A.H. (2024)a. New record of *Paphia textile* (Gmelin, 1791) (Family: Veneridae Rafinesque, 1815) in the waters of the Iraqi coast. *American Journal of Sciences and Engineering Research*. 7(4): 143-147.
- Al-Maliky, T.H.Y., Shakir, Z.K., Jabbar, I.M.A. & Salbok, H.A.Z. (2024)b. New record of a gastropod *Nassarius gayii* Kiener 1834 in the Northwest Arabian Gulf. *Int. j. adv. multidisc. res. stud.* 4(4):1312-1313. DOI: <https://doi.org/10.62225/2583049X.2024.4.4.3191>.

- Al-qaisi, R.H. & Farman, K. (2023). New record of exotic land snail *Rumina decollata* (Linnaeus, 1758) in Iraq. Communications Faculty of Sciences University of Ankara Series C Biology, 32(1), 54-58.
- Batts, J. H. (1957). Anatomy and life cycle of the snail *Rumina decollata* (Pulmonata: Achatinidae). The Southwestern Naturalist, 74-82.
- De Francesco, C.G. & Lagiglia, H. (2007). A predatory land snail invades central-western Argentina. Biological Invasions, 9, 795-798.
- Dehnen-Schmutz, K. & Touza, J. (2008). Plant invasions and ornamental horticulture: pathway, propagule pressure and the legal framework. Floriculture, ornamental and plant biotechnology, 5, 15-21.
- Drew, J., Anderson, N. & Andow, D. (2010). Conundrums of a complex vector for invasive species control: a detailed examination of the horticultural industry. Biological invasions, 12, 2837-2851.
- Ekin, I. (2025). Introduction of *Rumina decollata* (Linnaeus, 1758) for pest snail management in citrus orchards in Türkiye: ecological, economic, and agricultural perspectives. Agroecology and Sustainable Food Systems, 49(5), 722-742.
- Epanchin-Niell, R., McAusland, C., Liebhold, A., Mwebaze, P. & Springborn, M.R. (2021). Biological invasions and international trade: Managing a moving target. Review of Environmental Economics and Policy, 15(1), 180-190.
- Ghulam, I.N. (2025). First Record of *Rumina decollata* (Linnaeus, 1758), a Terrestrial Snail, in the Middle Euphrates Region, Iraq. Journal of Natural Science, Biology and Medicine, 16, 165–173.
- Martin, K. & Sommer, M. (2004). Relationships between land snail assemblage patterns and soil properties in temperate-humid forest ecosystems. Journal of Biogeography, 31(4), 531-545.
- Mc Donnell, R., Santangelo, R., Paine, T. & Hoddle, M. (2016). The feeding behaviour of *Rumina decollata* (Subulinidae: Gastropoda) raises questions about its efficacy as a biological control agent for *Cornu aspersum* (Helicidae: Gastropoda). Biocontrol Science and Technology, 26(3), 331-336.
- Naser, M., Yasser, A., Abdul-Sahib, I., Abdul-Sahib, A. & Auda, N. (2024). First record of *Dosinia prostrata* (Linnaeus, 1758) (Bivalvia: Veneridae) from the Iraqi coast. Journal of Fauna Biodiversity, 1(1), 8–11.
<https://doi.org/10.70206/jfb.v1i1.10189>
- Rau, A.I., Beltramino, A.A., Serniotti, E.N., Pizá, J., Caffetti, J.D. & Vogler, R. E. (2022). The exotic snail *Rumina decollata* (Linnaeus, 1758) (Gastropoda, Achatinidae, Rumininae) in Argentina: new records, range extension, and areas of origin of Argentine populations.

- Jabbar, I., Al-Maliky, T., Al-Sheraa, A., Hashim, M., & Al-Waeli, A. (2025). First Record and Southern Range Expansion of *Rumina decollata* (Linnaeus, 1758) (Gastropoda: Subulinidae) in Iraq. *GPH-International Journal of Biological & Medicine Science*, 8(7), 45-54. <https://doi.org/10.5281/zenodo.17019273>
- Reyna, P. & Gordillo, S. (2018). First report of the non-native snail *Rumina decollata* (Linnaeus, 1758) (Subulinidae: Gastropoda) in Córdoba (Argentina): implications for biodiversity and human health. *American Malacological Bulletin*, 36(1), 150-152.
- Rodríguez, J., Rodríguez-Salvador, B., Novoa, A. & Pyšek, P. (2024). Global trade in alien species: a challenge for insect conservation. In *Biological Invasions and Global Insect Decline* (pp. 91-115). Academic Press.