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## First record of peregrine shrimp *Metapenaeus stebbingi* Nobili, 1904 (Crustacea, Decapoda: Penaeidae) in the Iraqi waters, North-West Arabian Gulf

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### Abstract:

One male specimen of the species *Metapenaeus stebbingi* Nobili, 1904 was first recorded in November 2021 from the Iraqi territorial waters, Northwest of the Arabian Gulf. Therefore, the investigated shrimp species nominally corresponds to the original description of *M. stebbingi* through the main diagnostic features. It must be adopted in the spread and expansion of species, a new record of the area, and a distinctive addition to the species of commercial shrimp within the Iraqi marine waters.

**Keywords:** Decapod, Malacostraca, *Metapenaeus stebbingi*, Penaeid.

### Introduction:

The family Penaeidae is the largest of the crustaceans representing the most abundant species of commercial importance. Shrimp in comparison with arthropods, are characterized by large size most common as seafood <sup>1,2</sup>. Shrimp of two the genus *Penaeus* and *Metapenaeus*, are major commodities in the fisheries sector <sup>2</sup>. The genus *Metapenaeus* is one of the important shrimp genera that is widespread throughout the Indo-Pacific regions, represented by ten species, including *Metapenaeus stebbingi*, out of worldwide 24 species <sup>3</sup>. The shrimp was studied in Kuwaiti waters, and four species of commercial shrimp were recorded, they were divided into two groups, the first living in muddy bottoms under the tidal, and included *Penaeus semisulcatus*, *Parapenaeopsis stylifera*, and *M. stebbingi*, while the second group included *Metapenaeus affinis* in the region Tides <sup>4</sup>. Some studies have shown that *M. stebbingi* makes up 4% or less of the total shrimp catch in the Arabian Gulf waters, as is the case in Kuwaiti waters, where most of the catch is *P. semisulcatus* (40%) and *M. affinis* (48%). as well as in Iranian waters

where most of the shrimp catch is from *Penaeus merguensis* (60-70%) <sup>5,6</sup>.

The genus *Metapenaeus* in the Iraqi is represented by the one species *M. affinis*, first recorded by <sup>7</sup>. Recently, a campaign has been organized to classify some of the invertebrates of the Iraqi coast, including the shrimp log, *Alpheus edwardsi* <sup>8</sup>. The most important species of commercial shrimp in the Iraqi regional and internal waters are *P. semisulcatus*, *M. affinis*, *P. stylifera* and *Macrbrachium nipponense*, which can be used in aquaculture <sup>9,10</sup>. Despite the scientific development that took place using molecular classification to classify aquatic invertebrates, the phenotypic characteristics remained the most important factor in classifying and diagnosing their species <sup>11,12,13</sup>. It is possible to depend on this species of commercial shrimp that can be exploited in farming.

The current study aims to report the first record of shrimp *M. stebbingi* in the Iraqi marine waters, Northwest of the Arabian Gulf as a new record of commercial shrimp in the Iraqi marine catch.

### Materials and methods:

One live male *M. stebbingi* shrimp was collected in November 2021 from the current study area (29° 51' 18" N 48° 40' 52" E) NW of the Arabian Gulf (Fig.

1), using a benthic traction trawl at a depth of more than 10 meters, and it was caught with two species of shrimp *M. affinis* and *P. stylefera*. The shrimp was kept in a plastic bottle in an alcohol solution at 70%, and the diagnostic study was completed in the laboratories of the Department of Marine Biology, Marine Science Center, at the University of Basrah, Iraq. Taxonomic parts of the specimen were photographed using a stereomicroscope (Carl Zeiss

- Stemi 2000-C). A camera (Canon G10, 52 mm wide) was attached to show the descriptions of the shrimp parts through the display screen. The distinctive characteristics are mentioned in the FAO Marine Species Identification Sheets<sup>14,15</sup>.

**Material examined:** Single male, total length (LT)= 88 mm, carapace length (LC)= 20 mm.

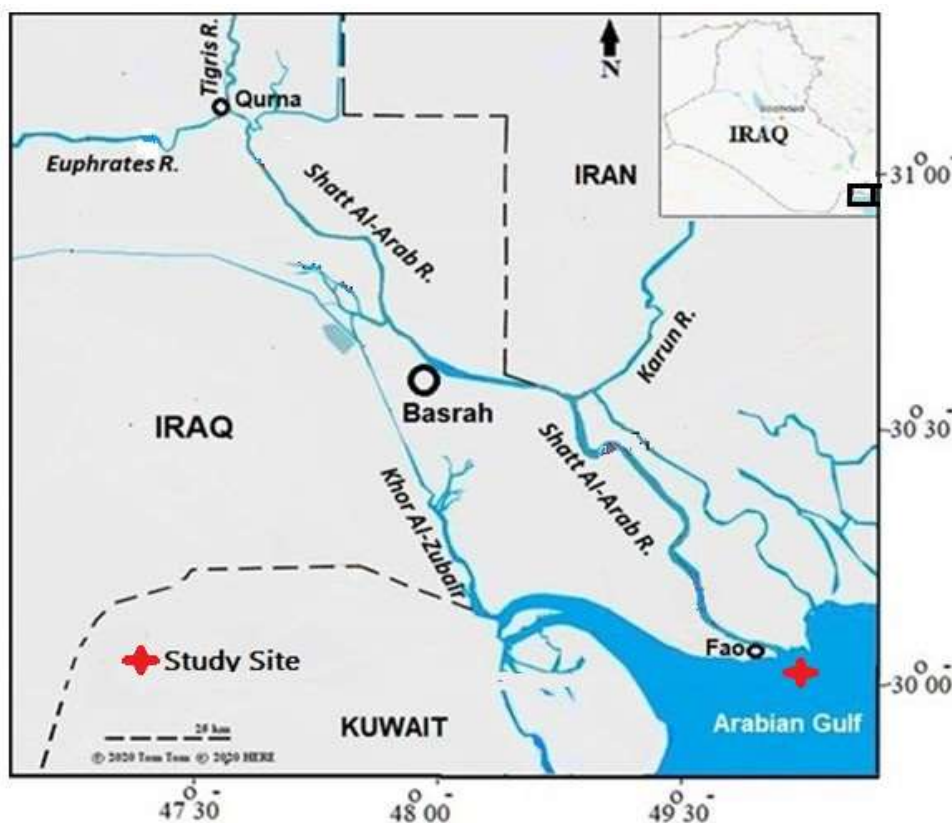


Figure 1. Local map showing the sampling area.

## Result and Discussion:

### Systematic Treatment

Kingdom: Animalia

Phylum: Arthropoda

Class: Crustacea (Brunnich, 1772)

Order: Decapoda (Latreille, 1802)

Infraorder: Penaeidea Rafinesque, 1815

Family: Penaeidae Rafinesque, 1815

Genus: *Metapenaeus* Wood-Mason and Alcock, 1891

*Metapenaeus stebbingi* Nobili, 1904<sup>16</sup>.

### Synonyms

*Penaeopsis stebbingi* De Man, 1911

*Mangalura stebbingi* Burkenroad, 1959

*Metapenaeopsis stebbingi* Kensley, 1969.

### Description

The shrimp has a body almost devoid of whiskers. It is characterized by creamy yellow color with gray

spots and rust on the body and pereiopods. The antennas and the distal part of uropods are grayish-purple rust. Rostrum is characterized by seven teeth on the dorsal margin, however no teeth were found on the ventral margin. The posterior epigastric segment's dorsal tooth is well separated from the other rostral teeth. All specifications (spots and teeth) are indicated in Fig. 2 A and B.

Post-spine keel is low, wide, and ends near the middle of the carapace length, this, the latter is supplied with antennae and spines of the liver.

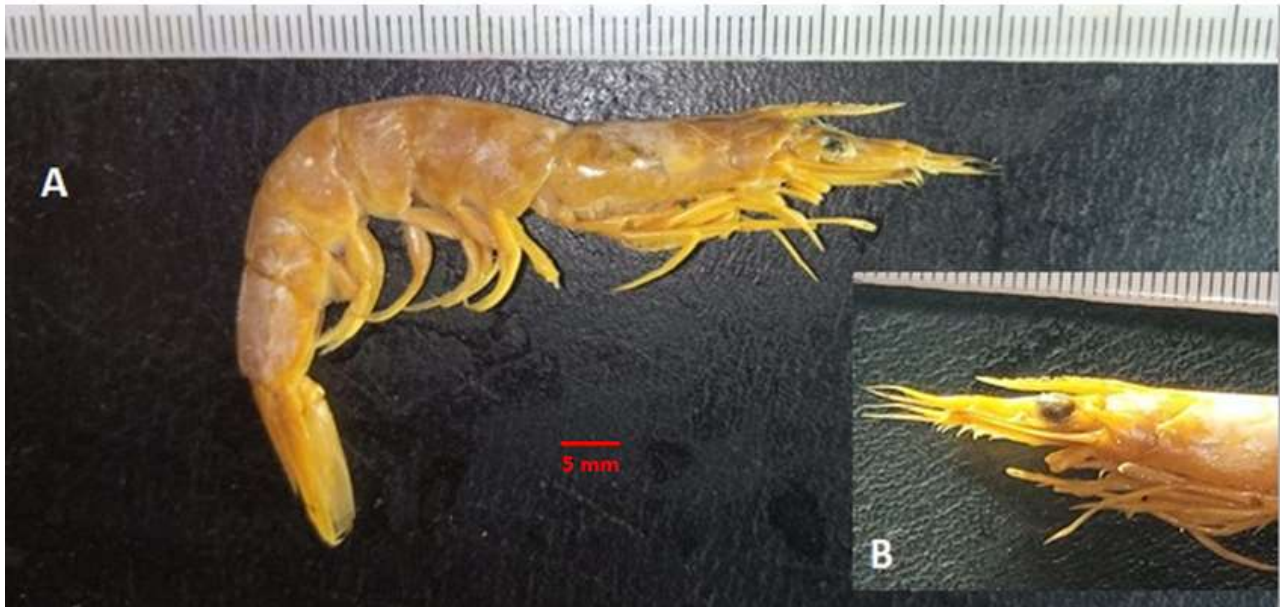


Figure 2. A, Male *Metapenaeus stebbingi* Nobili, 1904, B, Cephalothorax.

The two distomedian projections of petasma have a hard styloid attachment, directed forward and serrated on the ventral margin. Furthermore, two pens are next to each other in the apical portion of

petasma. Therefore, the lateral division is directed outward and separated in the dorsal and ventral processes (Fig. 3 A and B.).

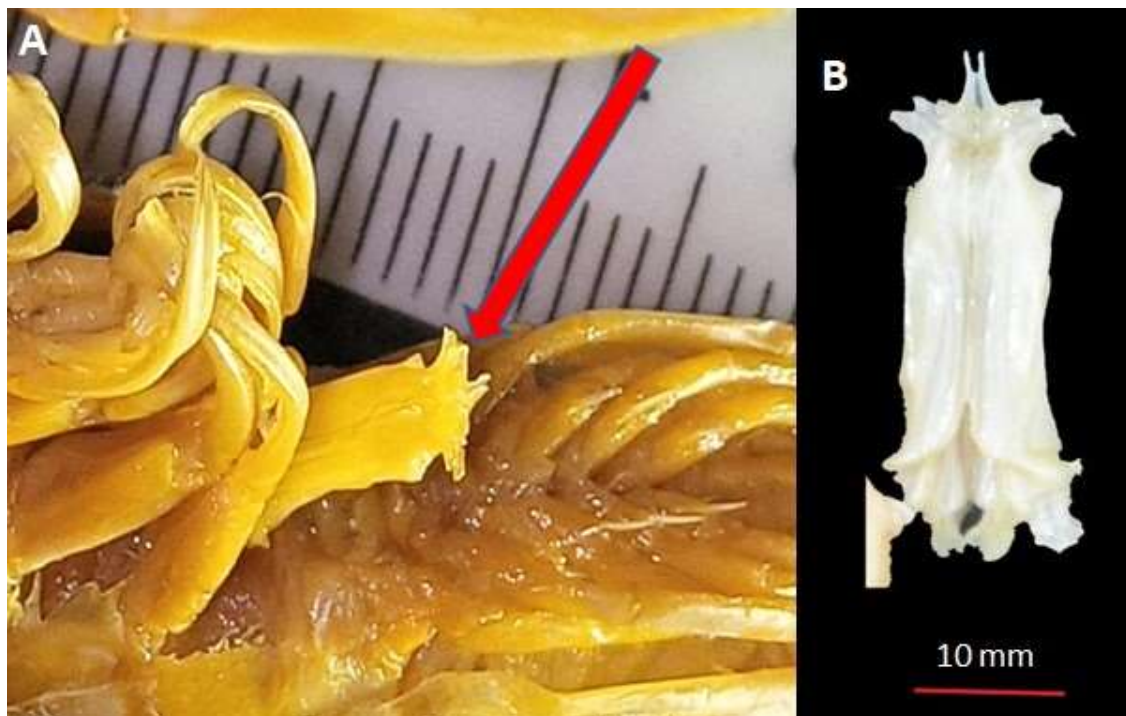


Figure 3. Male, *Metapenaeus stebbingi* Nobili, 1904, A, B, Petasma.

The merus of the fifth pair of pereopods has a close degree followed by a compressed rounded tuber (Fig. 4 A and B).

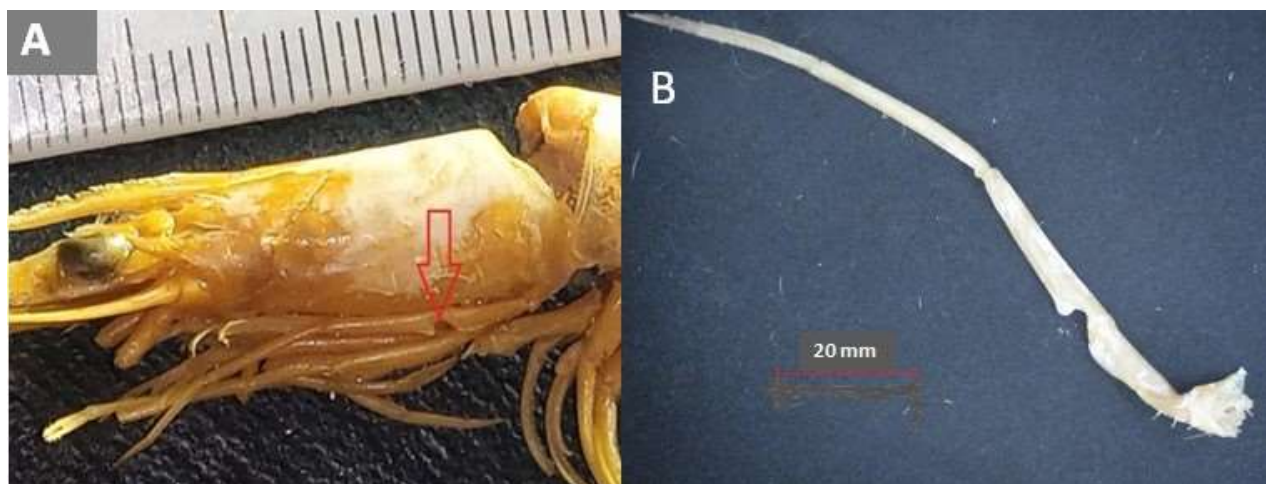


Figure 4. Male, *Metapenaeus stebbingi* Nobili, 1904, A, B, merus 5<sup>th</sup> pereopod.

Telson has a median groove, characterized by being lined with small cracks in the horizontal edges (Fig. 5).



Figure 5. Telson of *Metapenaeus stebbingi* Nobili, 1904.

The body is naked, with some hairs. The rostrum is straight, slender, and narrow, extending forward until the outer end of the peduncle of the horn or beyond that. The rostrum contains between seven to ten dorsal teeth with no teeth on the ventral edge. There is a dorsal back spine above the stomach area. The complaint is separate from the rest of the rostrum thorns and compared to *P. semisulcatus* which is distinguished by teeth found on both sides of the dorsal and ventral rostrum<sup>15, 17</sup>. The carapace area contains two spines (cornea and hepatic) with a distinct gill crest but without longitudinal sutures. There is a groove behind the snout, low and wide, ending near the middle of the length of the shield.

The telson contains a medial groove whose lateral edges are armed with fine spicules. The branching segment of the fifth pair of pereopods (walking legs) contains a foramen followed by a compressed and rounded tubercle.

The male organ contains a pair of median processions, each with a typical, forward-facing, serrated appendix on the ventral margin, and there are two longitudinal appendages next to each other in the median part of this organ. However, the female organ in the females has a transverse crest protruding forward between the two lateral plates, and these lateral plates are triangular. Individuals are white-yellowish with scaly gray and red spots. It has a total length of 13.9 cm and is common between 8-12 cm. It lives on sandy clay soil at a depth of between 50-90 meters, and this is the depth at which it is generally found<sup>4,18</sup>. Fished by pocket-shaped nets, consume fresh<sup>18</sup>.

#### Remarks

Only one species of the genus *Metapenaeus* Wood-Mason and Alcock, 1891 was known in the Iraqi coast overlooking the Arabian Gulf. The *M. affinis*<sup>17</sup>, and the *M. stebbingi* can be easy to distinguish and isolate from the *M. affinis* through its smaller size, color, and shape of the male member's petasma, as well as from the shape of the thigh with merus 5<sup>th</sup> pereopod. The record of *M. stebbingi* is the first on the marine Iraqi territorial waters northwest the Arabian Gulf. It is possible to rely on the taxonomic key mentioned by<sup>19</sup> to distinguish between *M. affinis* and the species recorded (*M. stebbingi*) in the present study.

The distribution of the peregrine shrimp extends within the western Indo-Pacific region: from East Africa, and Red Sea to Pakistan and northwest India. It is also distributed in the Eastern Atlantic Ocean, Eastern Mediterranean, it spreads in estuaries and saline lagoons from Tunisia, Egypt, to the coast of Palestine <sup>1,15,18</sup>.

Commercial fishing for the *M. stebbingi* shrimp occurs in a Mediterranean coast of Egypt, the Red Sea, the Gulf of Aden, the Pakistani coast, India and Madagascar, where this shrimp species is an important part of commercial fishing in these regions <sup>1</sup>.

### Conclusion:

The shrimp *M. stebbingi* mixed with *M. affinis* and *P. stylifera* has been observed during fishing operations in the waters of the northwest Arabian Gulf. And *M. stebbingi* is a species caught commercially within the shrimp catch. There is a need to follow up and study its existence, its spread and its biological impact, especially on other species of shrimp in the Iraqi coasts in the northwest of the Arabian Gulf.

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### Authors' declaration:

- Conflicts of Interest: None.
- We hereby confirm that all the Figures and Tables in the manuscript are ours. Besides, the Figures and images, which are not ours, have been given the permission for re-publication attached with the manuscript.
- The author has signed an animal welfare statement.
- Ethical Clearance: The project was approved by Marine Science Centre, University of Basrah. Iraq.

### Authors' contributions statement:

- T. H. Y. A. M. Presentation of the idea, diagnosis and classification of shrimp, discussion of results and writing of the manuscript. R. Z. K. Contributed to the design and implementation of electronic research, and discussion of the results. A. H. Z.. Verify methods and classification keys, discuss results, and contribute to the final manuscript.

### Reference:

1. Holthuis LB. FAO species catalogue Vol. 1: Shrimps and prawns of the world, an annotated catalogue of species of interest to fisheries, FAO Fish. Synop. 1980; 125: 271.
2. Wulandari T, Kartika WD, Rianny H. The commercial coastal shrimp of the Penaeidae family from Tanjung Jabung Timur, Indonesia. AACL Bioflux, 2019; 12, 6. <http://www.bioflux.com.ro/docs/2019.2221-2226.pdf>.
3. Chanda A. A check list of Penaeid prawns found in Indian water with their distribution. IOSR. J Phar Bio Sci. 2017; 12(3): 26-31. <https://www.readcube.com/articles/10.9790%2F3008-1203052631>.
4. Bishop JM, Khan MH. Use of intertidal and adjacent mudflats by juvenile penaeid shrimps during 24-h tidal cycles. J Exper Mar Biol Ecol. 1999; 232 (1): 39-60.
5. Momeni M, Kamrani E, Safaie M, Kaymaram F. Population structure of banana shrimp, *Penaeus merguensis* De Man, 1888 in the Strait of Hormoz, Persian Gulf. Iranian J Fish Sci. 2018; 17(1): 47 -66. <https://jifro.ir/article-1-3268-en.pdf>.
6. Mathews CP. Shrimp fisheries management project phase II. Kuwait Intitute for Scientific Research. Mar Fish Rev.1994; 56(1): 23-30.. <https://spo.nmfs.noaa.gov/sites/default/files/pdf-content/MFR/mfr561/mfr5613.pdf>.
7. Miquel LC. Supplementary notes on species on species of *Metapenaeus* (Decapoda: Penaeidae). Crustaceana. 1983; 45: 71-76. <https://www.jstor.org/stable/20103848>.
8. Al-Maliky THY, Al-Khafaji KK, Khalaf TA. New record of the snapping shrimp *Alpheus edwardsii* (Audouin, 1826) (Crustacea: Alpheoidea) in Basrah, Iraq. Arthro. 2017; 6(2): 47-53.
9. Al-Maliky THY. Economic feasibility of establishing a farm to raise commercial shrimp in Basrah - Southern Iraq. Int. J Applied Sci. 2022; 5(4): 1-8.
10. Al-Maliky THY. The Study of annual shrimp stocks in Masshab (Al-Hammar Marsh), Basrah, Southern Iraq. Int. J Applied Sci. 2022; 5(4): 9-16. <http://gphjournal.org/index.php/as/article/view/578/372>.
11. Zaar EO, Jaweir HJ. Morphological and Molecular Identification of *Limnodrilus Claparede*, 1862 Species (Clitellata: naiDIDAE) IN Tigris River, Baghdad/Iraq. Baghdad Sci J. 2021; 18 (2): 7 p. <https://doi.org/10.21123/bsj.2021.18.2.0231>
12. Abbas EM, Kato M, Sharawy ZZ. Phylogenetic relationship and systematic identification of different shrimp and prawn species in Egypt. Egypt. J. Aquat. Biol. Fish. 2022; 26(3): 565-578.
13. Hurzaid A, Chan T-Y, Nor SAM, Muchlisin ZA, Chen W-J. Molecular phylogeny and diversity of penaeid shrimps (Crustacea: Decapoda) from South-East Asian waters. Zoolo Scri. 2020; 49 (5): 594-613. <https://onlinelibrary.wiley.com/doi/abs/10.1111/zsc.12428>.

14. Fischer W, Bianchi G. FAO species identification sheets for fishery purposes. Western Indian Ocean (Fishing Area 51). Rome, Food and Agriculture Organization of the United Nations, 1984; 1-6.
15. Amin SA, Hassanen GDI, Ahmed MS. Identification and taxonomic study of shrimp in Bardawil Lagoon, North Sinai, Egypt. J Applied Sci. 2021; 10 (1): 39-46.
16. Nobili G. Diagnoses préliminaires de vingt-huit espèces nouvelles de stomatopodes et décapodes macroures de la Mer Rouge. Bull Mus Natl Hist Nat. 1904; 10: 228-238.
17. Al-Maliky THY. Manual and characters of common shrimps species in Southern Iraqi waters. Publications of the Marine Science Center - University of Basra – Iraq. Deposit number in the House of Books and Documents in Baghdad 756. 2013; 192 p. <https://faculty.uobasrah.edu.iq/uploads/publications/1636473650.pdf>.
18. Ben Hadj Hamida-Ben Abdallah O, Ben Hadj Hamida N, Jarboui O, Missaoui H. Première observation de la crevette faucon *Metapenaeus stebbingi* (nobili, 1904) dans le golfe de gabes. Bull Inst Natn Scien Tech Mer Salam. 2006; 33: 133-136. <https://aquadocs.org/bitstream/handle/1834/4269/note4.pdf?sequence=1&isAllowed=y>.
19. Chanda A. A Dichotomous Key to the Species under Genus *Metapenaeus* Wood- Mason 1891 from Indian Water. World Wide J Multidiscip. Res Dev. 2018; 4(2): 63-71.

## تسجيل اول للروبيان *Metapenaeus stebbingi* Nobili, 1904 في المياه العراقية، شمال غرب الخليج العربي (Crustacea, Decapoda: Penaeidae)

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### الخلاصة:

تم تسجيل الروبيان *Metapenaeus stebbingi* Nobili, 1904 لأول مرة في المياه الإقليمية العراقية، شمال غرب الخليج العربي في نوفمبر 2021. والصفات المظهرية تتوافق في الروبيان الحالي اسمياً مع الوصف الأصلي للروبيان *M. stebbingi* من خلال السمات التشخيصية الرئيسية ويجب اعتماد ذلك في انتشار وتوسع الأنواع، وهو أحد التسجيلات الجديدة في المنطقة، وإضافة مميزة لأنواع الروبيان التجاري داخل المياه البحرية العراقية.

**الكلمات المفتاحية:** عشارية الاقدام، ناعمة الدروع: *Metapenaeus stebbingi*، الروبيان البنايدي.