

First occurrence of two crab species, *Actaea calculosa* (Milne Edwards, 1834) and *Atergatis integerrimus* (Lamarck, 1801), family Xanthidae in Iraqi coast waters

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ABSTRACT

The crab *Actaea calculosa* (Edwards, 1834), belonging to family Xanthidae (Macleay, 1838) has been recorded in many coastal waters worldwide. In the shallow waters of the southern side of the Persian-Arab Gulf, another crab species, *Atergatis integerrimus* (Lamarck, 1801), of the same family was detected. Those two crab species were addressed in the current study. During the study period (12 January - 19 June 2019), crab specimens were collected from Al-Faw city at the intertidal and subtidal zones in the southern part of Shatt Al-Arab Estuary. Diagnostic features of both species were reported. The description of the latter species is close to that of *A. roseus* from the coastal waters of India and the Red sea, while it remarkably differs in the anterolateral margin shape of the carapace. The study aimed to increase the knowledge of the diversity of the marine fauna in the Iraqi coast waters, filling the gap in the data documented. In addition, this work would enhance our understanding of the fauna of this area and define the diversity and the distribution of these species and other crab species along the subtidal zone of the Iraqi coast waters.

INTRODUCTION

Species of Brachyuran crab belongs to Xanthidae family; they usually inhabit the rocky equatorial shores (Ng *et al.*, 2008). This family is the most common in the Persian-Arabian Gulf. Previously, 22 species of Xanthidae were listed, five of which were recorded for the first time in the region (Apel, 2001). Various studies have been conducted on the taxonomy of the crabs in the coastal water of Iraq (Al-Maliky *et al.*, 2016; Al-khafaji *et al.*, 2017a, b, c, d; Al-Khafaji *et al.*, 2019; Yasser *et al.*, 2020). The genus *Actaea* of Xanthid, commonly related to equatorial coral reefs, was studied and represented by 31 species (Ng *et al.*, 2008; Guinot & Low, 2010; Mendoza *et al.*, 2012; Ghotbeddin & Naserloo, 2014; Abdelsater *et al.*, 2015; Ng & Bouchet, 2015). specimens of *Actaea calculosa* were neither found nor recorded in previous studies related to other areas of the Persian-Arabian gulf coasts. Nevertheless, other species of genus *Actaea* were reported. Unfortunately, there is limited information about other

species of xanthid and brachyuran crabs, viz. their diversity, distribution and notes about their occurrence in the Persian-Arabian Gulf (Stephensen, 1945; Naderloo & Sari, 2005, 2007; Naderloo & Turkay, 2012; Naderloo *et al.*, 2013; Naderloo *et al.*, 2015). The two species, *A. calculosa* and *A. integerrimus*, are distributed in many parts worldwide including parts of the South of the Persian-Arabian Gulf, Oman Gulf and the Arabian Sea (Stephensen, 1945; Apel, 2001). These species can easily be distributed through various media such as water stream, swimming, gradual migration; larvae and adults can be transported by commercial and fishing vessels. In addition, the ecological conditions and inhabitants of these species are similar to those of the southern coasts of Iraq.

The current study was organized to address the first occurrence of two crab species, *Actaea calculosa* and *Atergatis integerrimus* in the Iraqi coast waters, Al-Faw city in the northern west of the Persian-Arabian Gulf to list them under the crabs of brachyuran of the Iraqi coast water.

MATERIALS AND METHODS

Samples collection: An environmental survey project was conducted on the coastal water of Iraq by the Marine Biology Department, Marine Science Centre, University of Basrah. Crab specimens were collected from the shallow water habitat of the intertidal and subtidal zones around the coastal water of the South of Al-Faw district, using trawl net and bottom grab samples (Fig. 1). During summer and winter (12 January to 19 June 2019), samples were collected from a depth ranging between 5- 15m. The study site is located at the latitude of 30.050578 and the longitude of 48.225495. Some environmental parameters were measured during the study period, including water temperature 12- 30 °C, pH 6.8- 8 and salinity 21- 26 ppt. Crab samples were brought to the Lab. Specimens of both species were placed in plastic containers then labeled and preserved in alcohol (70-80%).

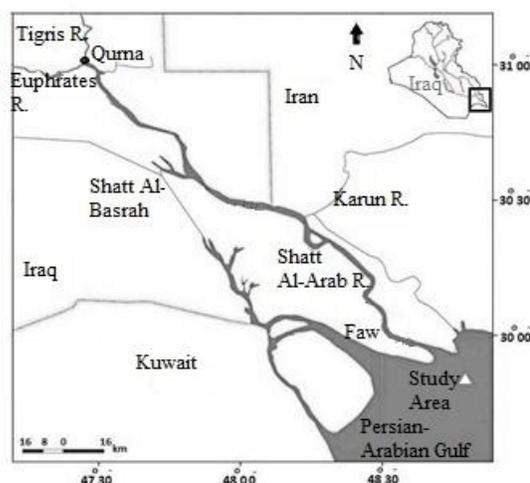


Fig 1. A map of the study area

Sample analysis: The samples of the two species were visually identified using a digital microscope, following the descriptions of **Naderloo *et al.* (2016a)**, **Naderloo, (2017)**, **Kalate *et al.* (2018)** and **Abdollahi *et al.* (2020)**. The crab samples were cleaned and then photographed in order to deposit in Marine Biology Department. The millimeter (mm) unit was used to record the size of samples. Whereas, CB and CL referred to carapace breadth and length, respectively.

RESULTS

1. Systematic taxonomy of *Actaea calculosa*

Order: Decapoda Latreille, 1802

Family: Xanthidae MacLeay, 1838

Genus: *Actaea* De Haan, 1833

Species: *Actaea calculosa* (Milne Edwards, 1834) (Fig. 2).

1. 2. Material examined

Four females of *A. calculosa* were collected from the coastal waters of Iraq, northern west of the Persian-Arabian Gulf, at a depth of 5-15m, using bottom grap samples during a period extending from 12 Jan. to 19 Jun. 2019. Fig. (2) shows a sample of *A. calculosa*, with CL 23 mm and CB 33 mm.



Plate (I)



Plate (II)

Fig. 2. *Actaea calculosa* (Milne Edwards), female. Plate I and II are abdominal and dorsal views respectively. CL 23 mm, CB 33 mm.

2. Systematic taxonomy of *Atergatis integerrimus*:

Order: Decapoda Latreille, 1802

Family: Xanthidae MacLeay, 1838

Genus: *Atergatis* De Haan, 1833

Species: *Atergatis integerrimus* (Lamarck, 1801) (Fig. 3).

2. 1. Material examined

Three males of *Atergatis integerrimus* were collected from the study area. The CL and CB were 78mm and 120mm, respectively.



Plate (I)



Plate (II)

Fig. 3. *Atergatis integerrimus*, (Lamarck, 1801), male. Plate I and II are abdominal and dorsal views, respectively. CL 78 mm, CB 120 mm.

DISCUSSION

Description of *A. calculosa*: The crab is medium in size, with a subcircular convex carapace. The length of the carapace is shorter than its breadth, its length is about two thirds its breadth. The regions and lobules are distinctly definite and sharply front-bilobed. The tubercles on the chelipeds are smoother than these on the carapace and hardly faced. Four distinct lobes are detected on the anterolateral borders. Fingers of chelipeds are short, pointed blunt and hardly hollow at a tip. The tubercles on the legs are never spiny.

Remarks: The whole of the carapace has intact sculpture with smooth, deep and shallow wide grooves. The regional lobules are distinctly demarcated. Smooth granules are found on the chelipeds, congregating with each other. The expert of the eye can separate *A. calculosa* from other species of genus *Actaea*, such as *A. savignyii* (Milne Edwards, 1834).

Distribution: No previous reports were documented about recording *A. calculosa* species from the Iraqi coast waters, only the crab species *A. jacquelinae* was recorded by Guinot in the Persian-Arabian Gulf (Naderloo *et al.*, 2016b). However, the species was recorded in the Indo-pacific region, Karachi and Mergui Archipelago (Alcock, 1898), Sri lankan side, the gulf of mannar (Laurie, 1906), the gulf of Thailand, the gulf of Siam, the China Sea, Tahiti, Sunda strait, port Okha, Australia, Kei islands and Japan (Sakai, 1976).

Description of *Atergatis integerrimus*: The carapace is suboval and transverse. Its length is shorter than the breadth, which is about 1.6 times longer than the length. Moreover, the carapace is slightly convex and has mini punctures all over the surface. These punctures

are also present on chelipeds, walking legs, abdomen and sternum. Narrow front is undetectably convex. A small slit divides the front into two lobes. The posterior lower margin of carapace is smaller than the width of frontorbital. The carapace has a reddish brown uniform color. Hairy blunt teeth are present upon the inner angle of the carapace's carpus.

Remarks: The crab has a walnut-brown colour, with yellow punctures. Three species of genus *Atergatis* were reported; namely, *A. integerrimus*, *A. laevigatus* (Milne Edwards 1865) and *A. Ocyroe* (Herbst, 1801) in Persian-Arabian Gulf. But these species haven't yet been recorded in the northwest Persian-Arabian Gulf.

Distribution: The *A. integerrimus* species (Lamarck, 1801) was recorded in Oman Gulf, the Persian Gulf, Zanzibar, the South of India, Taiwan, Pakistan, Philippines and Japan.

CONCLUSION

This study continues the work of previous studies, aligned with some ongoing studies that began the past decade and resulted in many species of invertebrates, (crabs in particularly) first recorded from the coast water of Iraq. It can be concluded that the current study was able to record the Xanthid crab species, *Actaea calculosa* and *Atergatis integerrimus* for first time in the coastal water of Iraq.

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