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Dear Ashwaq T. Abbas

The manuscript "**The occurrence of *Bacterium Vibrio* sp. in the *Macrobrachium nipponense* shrimp, collected from Al-Hammar Marsh, Sothern Iraq**" by Ashwaq T. Abbas, Abdulameer R. Jassim and Abdulhussein H. Ghazi is accepted for publication in **Indian J Ecology 48(18): 2021.**

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Prof A K Dhawan

# The occurrence of Bacterium Vibrio sp. in the Macrobrachium nipponense shrimp, collected from Al-Hammar Marsh, Sothern Iraq

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**The occurrence of Bacterium *Vibrio* sp. in the *Macrobrachium nipponense* shrimp, collected from Al-Hammar Marsh, Sothern Iraq**

bacterium *Vibrio* sp.

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**Abstract:**

This is the first report of the infection of the shrimp *Macrobrachium nipponense* by the *Vibrio* bacterial in the Iraqi waters. The diagnosis was done by using a specialized media and the expected causes of the disease were discussed and the conditions were described. The present article represented the first attempt to record cases of bacterial diseases in the shrimps, which is considered as an invasive species to our local environment.

**Keywords:** *Vibrio*, Bacteria, shrimp, Infection, Iraq

**Introduction**

The genus *Macrobrachium* includes several important species that exist in the brackish and freshwater habitats. The Oriental River shrimp, *Macrobrachium nipponense* is a small shrimp with maximum length of 86 mm for male and 75 mm for female (Holthuis, 1980). The females sexually mature at 4-5 months of age and mating occur between newly molted females and hard shelled males (New *et al.*, 2010). The shrimp *M. nipponense*, is belonging to the caridean shrimps of the family Palaemonidae, Genus *Macrobrachium*, Species *nipponense* (Fransen, 2017). It is originated from North China to Annam, Japan and Taiwan (Cai and Ng, 2002). Recorded in Sangaphora, Philipen (Cai and Shokita, 2006), and Ozbakstan (Mirabdullaev and Niyazov, 2005). Recently it was recorded in the Caspian lake basin in North Iran (De Grave and Ghane, 2006). The first



records of the species in Iraq during the year 2002, specimens of *M. nipponense* appearing frequently in the benthic samples from Garimat Ali River, near Al-Hammar Marshes (Salman *et al.*, 2006). The bacterial diseases of the river shrimp (*M. nipponense*) is one of the major diseases in the river shrimp culture industry in China (Shen *et al.*, 2000). This article is aiming diagnosing and recording the first bacterial infection of the present specimen fresh water, which was recently registered in Iraq.

#### **Material and Methods:**

Specimens of *M. nipponense* were sampled monthly, from Al- Dawoodi River, near Al - Hammar Marsh during December 2015 to November 2016, by a trawl net of 1 cm mesh size at 5-6 m for 20 min. The situated sampling between 30° 39' 34.27" N , 47° 39' 13.81" E, which is located about 1 km south Al-Hammar marsh and connected with Shatt Al- Arab estuary through Shatt Al-Arab River (Fig. 1). All collected samples were input in cold box and transport to the laboratory of Marine Biology at University of Basrah for further analysis.

samples were investigated morphologically and under microscope to detect the infection. A 1 g of the infected tissue (end of edge were incised by using a sterile scalpel). These samples were homogenized in 9 ml of sterile normal saline solution 0.1ml of the solution were inoculated on to thiosulfate citratebile sucrose salt agar (TCBS) (Himedia-India). Pure samples of colonies were sent for identifying by VITEK 2 system (Biomérieux- USA).

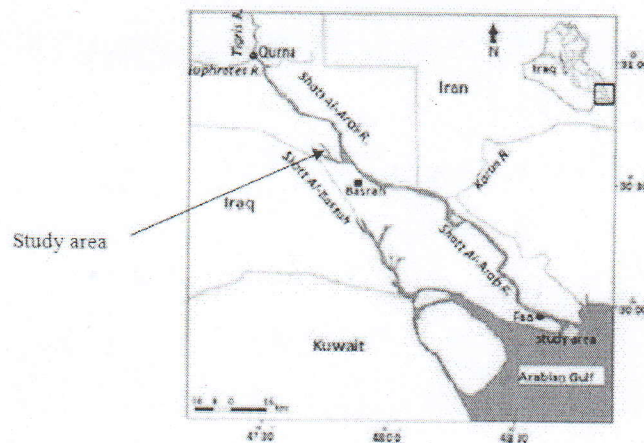


Fig. 1: Geographical location of the sampling site in Al-Hammar marsh, Southern Iraq.

### Results:

Morphologically the infected shrimps were having clearer erosion with black color on the walking legs (pereopodes); also there is a simple black spot on the cuticle of early abdominal segment (Fig 2 ). Under the microscope, the appendages appear cut and the damage is very clear in the cuticle with necrosis started from the tip of the leg and progressed to the base. The infection was reported on the walking with great damage and severe infection while such a case was not recorded anywhere on the swimming legs. Prevalence of infection was very high ( more than 90%). The colonies were well developed in specific media of vibrio and had a yellow spherical shape. Vibriosis was caused by gram-negative bacteria. Pure samples of the colonies were sent for diagnosis using the VITEK device but unfortunately the species was not identified because the device data were not updated. The samples of the shrimp collected looked healthy, but it was obvious from the shape of the infection that they caused serious damage by the loss of parts of the legs.





Fig. 2: Morphological infection of the walking legs of *Macrobrachium nipponense* with bacterium *Vibrio* sp.

#### Discussion:

Gopal *et al.*, (2005) recorded many *Vibrio* species from the water, sediments and shrimps at shrimp farms from the east and west coasts of India. Jayasre *et al.* (2006) identified five types of diseases in *Penaeus monodon* (tail necrosis, shell disease, red disease, loose shell syndrome, and white gut disease) which caused by six species of *Vibrio*: *V. harveyi*, *V. parahaemolyticus*, *V. alginolyticus*, *V. anguillarum*, *V. vulnificus*, and *V. splendidus*. Depending on the clinical symptom and specific media the infection of the *M. nipponense* shrimp can be assign types of *Vibrio* species. Infection of walking legs with this severity and the disinfection of most other parts of the body of the animal, clearly indicate that the source of this infection is the high bacterial load of the bottom or sediments of the region in which the shrimp live. However, Al-Salim and Al-Salman (2013) mentioned that the number of bacteria in the water and sediments of Germat Ali and Harrir area (west of Al-Hammar marsh) was high, with the highest number of bacteria in the water and sediments of Germat Ali. This means that pollution in the study area has reached an advanced stage, causing an increase in bacterial load that directly and indirectly affects the benthic animals. In China the diseases found in *M. nipponense* farming population were due to intensive culture and environmental pollution (Pan *et al.*, 2009).



In the present region the studies available in the field of shrimp diseases are very few and limited to the study of Jassim (2013) and Ahmed and Bader (2015). The present study represents the first of its kind on the bacterial diseases of the shrimp in Iraq and represents the first attempt to study *M. nipponense* diseases. The study of diseases of exotic species is important because of the direct and indirect effects that can occur in the aquatic environment, especially on other shrimp species that are present in the same environment.

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