



Palaemon mesopotamicus (Pesta, 1913) (Palaemonidae: Crustacea): A Threatened Freshwater Crustacean from Southern Türkiye

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Abstract

The Mesopotamian freshwater shrimp, *Palaemon mesopotamicus* is a critically endangered species native to Orontes River basin in southern Türkiye as well as the Orontes and Khabur Rivers, the latter being a tributary of the Euphrates in Syria. Its populations are declining primarily due to habitat degradation caused by dam constructions and increasing water pollution. Immediate protection actions are urgently needed to safeguard the remaining populations of this species in the Orontes River basin. In this study, the distribution, biological characteristics, ecological significance, and conservation status of *P. mesopotamicus* in southern Türkiye are presented.

Keywords: Critically Endangered, Mesopotamian shrimp Orontes River, Red List, Conservation

Introduction

The Mesopotamian freshwater shrimp, *Palaemon mesopotamicus* (Pesta, 1913) a species belonging to the Palaemonidae family, is a freshwater crustacean native to southern Türkiye (Orontes River) and Orontes River and Khabur River in the north-west of Syria (d'Udekem d'Acoz, 1999, Özcan et al., 2011). It was discovered by the Czech zoologist Jaroslav Pesta in 1913. It is one of the many unique and ecologically significant organisms found in the rivers and lakes of the region. The species is only known from three records, two of which are pre-1939 (both Syria) (Pesta, 1913; d'Udekem d'Acoz, 1999) and one in 2011 in Türkiye (Özcan et al., 2012) and it is currently not clear if the species is still present in Syria. Due to the narrow width of the river system (max. 27 m wide), the currently known distribution area of the species is less than 10 km². This article aims to explore the biology, ecological importance, and conservation status of *P. mesopotamicus* in southern Türkiye.

Taxonomy and Systematics

One of the most abundant taxa of Decapoda is the family *Palaemonidae* (De Grave & Ashelby, 2013). The genus *Palaemonetes* seen in inland waters was transferred to the genus *Palaemon* by De Grave & Ashelby (2013). The genera *Palaemonetes* Heller, 1869, *Exopalaemon* Holthuis, 1950 and *Coutierella* Sollaud, 1914 are junior synonyms of *Palaemon* Weber, 1795. Today, the genus *Palaemon* is represented by a total of 83 species (De Grave & Ashelby, 2013). Sollaud (1938) divided the European and Mesopotamian forms of *Palaemonetes* (*Palaemon*) into 5 species and reported *P. mesopotamicus* from the fresh waters of Mesopotamia, according to Holthuis (1950). The genus *Palaemon* Weber, 1795 is represented by 3 species in the freshwaters of Türkiye; *Palaemon turcorum* (Holthuis, 1961), *Palaemon antennarius* H. Milne Edwards, 1837 and *P. mesopotamicus* (Pesta, 1913) (Figure 1). The nomenclature for the species follows World Register of Marine Species (WoRMS) (DecaNet, 2025).

Kingdom Animalia

Phylum Arthropoda

Subphylum Crustacea

Class Malacostraca

Order Decapoda

Family Palaemonidae

Genus *Palaemon*

Palaemon mesopotamicus (Pesta, 1913)

Common names: Mesopotamian freshwater shrimp

Local name: Mezopotamya Tatlısu karidesi

Remarks: Initially, the species has been recognized and described as a subspecies, *Palaemonetes varians* (Leach) nov. var. *mesopotamicus* (Pesta, 1913). However, then, its taxonomic state was rearranged as being a separate species. De Grave and Ashelby (2013) indicated that the genus *Palaemonetes* Heller, 1869 is the junior synonym of the genus *Palaemon* Weber, 1795 and revised the species as *P. mesopotamicus* (Pesta, 1913).



Figure 1. Mesopotamian freshwater shrimp, *Palaemon mesopotamicus* (A: Living individual B: Fixed sample) (Photo: T. Özcan)

Identification: *P. mesopotamicus* the exopod is clearly shorter. Rostrum is strong and curved clearly outwards. Tip of the rostrum is segmented as upper and lower part in all specimens. The upper margin has 6-7 teeth and the lower segment has 2-4 dents. Telson has 10–12 plumose setae on posterior margin, third maxilliped exopod is shorter than ischiomerus and outer margin of scaphocerite is concave (Tzomos & Koukouras, 2015).

Size: The total length of males ranged from 26.1 to 34.1 mm and that of females from 38.7 to 40.3 mm (Özcan et al., 2012). The total length of individuals in the study by Erdoğan (2014) varied from a minimum of 11.0 mm to a maximum of 45.9 mm.

Distribution: The species is restricted to Khabur River and Orontes River basin covering the parts in Syria and Türkiye (Pesta, 1913; Özcan et al., 2012; Özcan et al., 2013; De Grave, 2013; Erdoğan, 2014; İpek and Özbek, 2022) (Figure 2).



Figure 2. Geographic distribution map of *Palaemon mesopotamicus* in Syria and Türkiye.

Habitat and Ecology: Although the species is generally known as a riverine species, there are some lacustrine forms of the species as well. The species inhabits slow-flowing freshwater systems and lake waters with a vegetation including *Potamogeton*, *Ceratophyllum*, *Lemna* and other abundant aquatic plants between 0.2 and 1 m depth (Özcan et al., 2012; Özcan et al., 2013; Erdoğan, 2014). Optimal water parameters for the species are the temperature at 26.2°C, the pH of 5.53 and the salinity of 0.4 ppt. This species prefers low turbidity waters and is generally sympatric with *A. orientalis* (Bouvier, 1913). Sometimes it inhabits muddy waters with small gravel substrate (Özcan et al., 2012; Özcan et al., 2013; De Grave, 2013).

Use and Trade: No

Food and feeding: No data is now available.

Reproduction: Estimated breeding season is from early April to June. Fecundity rate found to be very low (28-157 eggs per female) (Pesta, 1913; Özcan et al., 2012; Erdoğan, 2014) and egg diameter with the covering is 0.5-1.5 mm (Pesta, 1913; Sollaud, 1932; Özcan et al., 2012; Erdoğan, 2014).

Abundance: The species has been reported from Khabur River (which joins the Euphrates in Syria) and Syrian parts of the Orontes River basin (Pesta, 1913) and the Orontes River Basin in Türkiye (Karasu River, Gölbaşı Lake, Orontes River-Karasu stream conjunction, Kırkhan-Kumlu I, II. Canal and Comba Canal) (Özcan et al., 2012; Özcan et al., 2013; Erdoğan, 2014). However, there are no recent data on the populations of the species in Syrian part of Khabur and Orontes River. Furthermore, De Grave (2013) claims that the species has become extinct in the river Khabur.

Threats: Threats for Mesopotamian freshwater shrimp are pollution resulted from agricultural waste, habitat destruction due to dam construction on rivers and streams for irrigation, water regime changes resulting from dams, drought and habitat losses occurred in ecosystems.

Conservation Status: Listed as Critically Endangered under criteria B2ab(iii) in the IUCN International Red List (De Grave, 2013).

Conservation Action: Neither Türkiye nor Syria has implied any specific legal protection or conservation actions concerning the species yet.

Conservation Recommendations: *P. mesopotamicus* is currently at risk of extinction due to a combination of environmental stressors. Remaining populations of the species should be determined and action plans for conservation should be put into implementation for full protection of the species. Therefore, biology and ecology of this species need to be well-established. In both countries Türkiye and Syria biological and ecology studies on population size and structure, habitat requirement and reproduction of the species is required and should be encouraged. The destruction of the habitat structure of rivers, streams and lakes should be prevented. A detailed study of current population status, ecology and life history of Mesopotamian freshwater shrimp is essential. Water extraction from streams for irrigation must be regulated accordingly.

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Data Availability Statement: The data underlying this article will be shared with interested researchers.

Conflicts of Interest: The authors declare that they have no known competing for financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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