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First documented occurrence of the introduced Sailfin catfish *Pterygoplichthys disjunctivus* (Weber, 1991) in the inland waters of Syria (Orontes River)

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ABSTRACT

This manuscript documents the first recorded occurrence of the non-native species *Pterygoplichthys disjunctivus* from the inland waters of Syria, specifically the Orontes River. A specimen measuring 33 cm in total length and weighing 250 grams was caught in trammel nets at a depth of approximately 2-3 meters in the Orontes River near Hama on April 27, 2024.

Keywords: *Pterygoplichthys disjunctivus*, Orontes River, Sailfin catfish, Syria.

1. INTRODUCTION

Largest Loricariidae family within the Catfish order Siluriformes, comprises approximately 1228 species distributed across 164 genera. These Catfish are native to South America, except Chile and Panama. They have large bony plates and a ventral mouth. Within the Loricariidae family, species fitting the genus Pterygoplichthys and possessing ten dorsal fin rays or more are commonly called Sailfin Catfish (Armbruster and Page, 2006). *Pterygoplichthys disjunctivus* Weber, (1991), a member of the genus Pterygoplichthys, has demonstrated remarkable success in colonizing new habitats. This success is not due to specific biological factors, but rather to the popularity of this species in the aquarium trade (Orfinger and Goodding, 2018). Introducing Pterygoplichthys species has resulted in harmful environmental effects, including environmental degradation and ecological disruption. These species can establish in new environments that negatively impact native species.

One of the most significant impacts is the alteration of food web dynamics, as predicted by Nico and Martin, (2001) in Florida. Pterygoplichthys species have been introduced as potential pests to various countries outside their natural habitats, including Hawaii, Mexico, Puerto Rico, and the United States (Bunkley-Williams et al., 1994; Fuller et al., 1999; Edwards, 2001). Nico and Martin, (2001) and Wakida-

Kusunoki et al., (2007) have also documented the species in Southeast Asia. Additionally, it has been observed in the United Kingdom (Munson et al., 2024).

In the Middle East, *P. disjunctivus* was documented by (Golani and Snovsky, 2013). Previous records were reported by Özdilek, (2007) in Turkey, specifically on the Orontes River, but there are no previous records of this species in Syria. The inland waters of Syria's Orontes River Basin are home to the family Loricariidae, represented by the genus Hypostomus, which includes a single species, *Hypostomus punctatus*. The occurrence of *Pterygoplichthys disjunctivus* in the Syrian inland waters, specifically in the Orontes River Basin, has not been previously reported. This study presents the first documented occurrence of *P. disjunctivus* in the Syrian inland waters (Orontes River Basin).

2. MATERIALS AND METHODS

The *Pterygoplichthys disjunctivus* specimen was obtained during an artisanal fishing operation in the Orontes River (Middle Stream) near Hama City using trawl nets on 27 April 2024 (Figure 1). The surface water temperature at the time of capture was 20°C. To the nearest millimeter and gram, the sample was measured and weighted. The standard length (SL) was the basis for calculating percentages of morphometric measurements (Table 1).

Table 1 The morphometric measurements, recorded in centimeters (cm) and as a percentage of standard length (%SL), as well as the weight in grams, were documented for the Pterygoplichthys disjunctivus specimen captured off the Orontes River in Hama City.

Morphometric measurements	**cm**	**SL%**
Total length (TL)	33	140.4
Standard length (SL)	23.5	100
Head length	5.5	23.4
Body depth	10	42.6
Pre-dorsal fin length	9.2	39.1
Post-dorsal fin length	8.5	36.2
Pre-pectoral fin length	6	25.5
Post-pectoral fin length	3	12.8
Pre-pelvic fin length	11	46.8
Post-pelvic fin length	4	17
Pre-anal fin length	17.2	73.2
Post-anal fin length	2.5	10.6
Caudal peduncle depth	3	12.8
Dorsal fin base length	3.5	14.9
Pectoral fin base length	2.5	10.6
Anal fin base length	2.5	10.6
Adipose fin base length	2	8.5
Dorsal fin Height	4	17
Pectoral fin Height	7.2	30.6
Pelvic fin Height	5.5	23.4
Anal fin Height	3.5	14.9
Adipose fin Height	2.3	9.8
HL%		
Eye diameter	0.8	14.5
Snout length	4	72.7
Total Weight (TW, g)	250	

Figure 1 Map showing the capture site of *Pterygoplichthys disjunctivus* in the Orontes River near Hama City.

The specimen was preserved in buffered formalin solution (10%) and then transferred to the ichthyology laboratory at Tishreen University (Figure 2). The taxonomic key provided by Armbruster and Page, (2006) and Wanjari et al., (2024) was adopted when taking morphometric and anthropometric measurements.

3. RESULTS

The specimen of *P. disjunctivus* exhibited the following diagnostic characteristics: The specimen exhibited a large dorsal fin, and its abdomen exhibited a color pattern comprising light and dark vermiculations that resulted from the merging of spots. The dark ventrolateral vermiculation on the ventral surface of the body was either wider than or equal in width to the light vermiculation. It is

noteworthy that the specimen did not have a prominent supra-occipital process (Figure 2 A to C). The body was elongated and flattened, with a robust, armored head. The dorsal fin was composed of two spines, the first relatively small, while the second was more extensive and more robust.

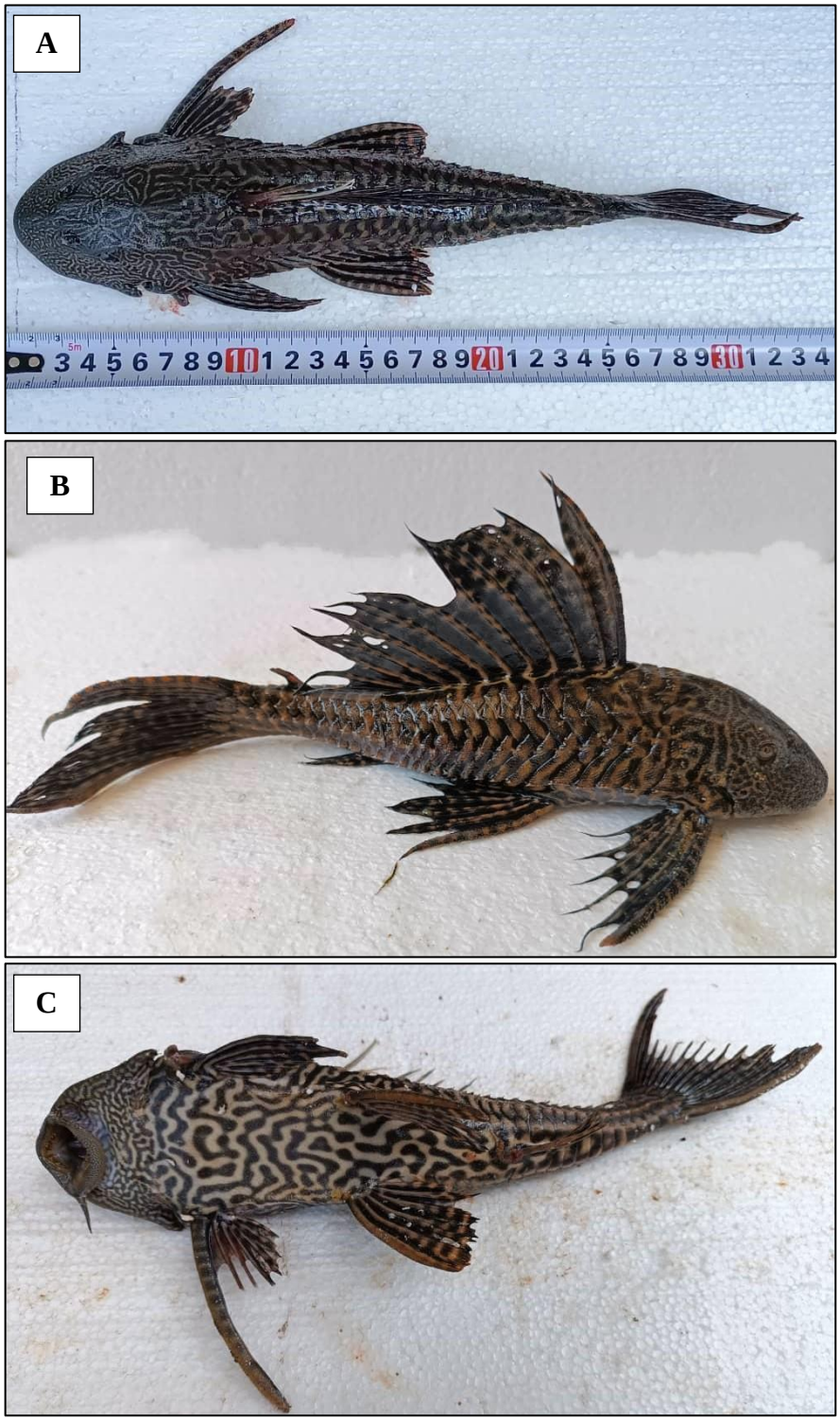

Figure 2 A specimen of *Pterygoplichthys disjunctivus* that had a total length of 33 cm and a total weight of 250 g of the Orontes River in Hama City. A) View that is dorsal, B) View that is lateral, and C) View that is ventral.

Furthermore, the dorsal fin exhibited ten soft rays. The adipose fin was relatively short, while the anal fin had one spine and four soft rays. The pectoral fin exhibited one spine and five soft rays, with the first ray being the largest. The caudal fin had a distinctive appearance due to its elongated and pointed lower lobe. There were 29 rows of lateral line plates that covered the body (Table 2). About coloration, the body exhibited patches of black and yellow, accompanied by dark vermiculations on the dorsal surface of the head. The fins exhibited a brown-grey hue with light grey dots. The abdominal region exhibited a reticulated pattern comprising white and brown elements.

Table 2 The meristics were documented for the Pterygoplichthys disjunctivus specimen captured from the Orontes River in Hama City.

Meristics	
Dorsal fin	II, 10
Pectoral fin	I, 5
Pelvic fin	I, 5
Anal fin	I, 4
Lateral line bony plates	29

4. DISCUSSION

P. disjunctivus is a species indigenous to the Amazon River basin in South America (Weber, 1992). It is pertinent to mention that this species is renowned for its invasive tendencies and has successfully established populations in a multitude of countries across North America, Southeast Asia, the United Kingdom, and the Middle East (Bunkley-Williams et al., 1994; Edwards, 2001; Nico and Martin, 2001; Page and Robins, 2006; Chavez et al., 2006; Wakida-Kusunoki et al., 2007; Özdilek, 2007; Golani and Snovsky, 2013; Bijukumar et al., 2015; Munson et al., 2024).

The existence of *P. disjunctivus* in Syria's inland waters has not been confirmed by published evidence. Consequently, the current report constitutes a significant scientific contribution, providing the first documented record of *P. disjunctivus* in Syrian inland waters. The manner of introduction of this species into the Syrian ecosystem remains a subject of speculation. It is a plausible assumption that the species was introduced via the aquarium trade, where it is frequently sought after due to its ornamental value. Nevertheless, the spread and stabilisation of *P. disjunctivus* in this region and consequently in Syrian inland waters require further investigation.

5. CONCLUSION

This discovery highlights the importance of monitoring and managing invasive species, as their establishment in new ecosystems can have significant ecological and economic ramifications. Further investigation and monitoring are required to determine the presence of *P. disjunctivus* in Syrian freshwaters.

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Author's Contribution

All authors contributed equally.

Ethical Approval

The Animal ethical guidelines are followed in the study for species observation and identification.

Conflicts of interests:

The authors declare that there are no conflicts of interests.

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Data and materials availability

All data associated with this study are present in the paper.

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