Marine Science Center-University of Basrah

Mesopotamian Journal of Marine Sciences
Print ISSN: 2073-6428
E- ISSN: 2708-6097
www.mjms.uobasrah.edu.iq/index.php/mms

Northernmost record of the pinjalo snapper, *Pinjalo pinjalo* (Bleeker, 1850) (Perciformes: Lutjanidae) in the northern Indian Ocean: a record from the Iraqi marine waters

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Article info.
✓ *Received: 25 May 2023*
✓ *Accepted:4 October 2023*
✓ *Published: 29 December 2023*

Key Words:
Al-Ezz River,
Water pollution,
Heavy metal,
north of Basra

Abstract - One specimens measured 270 mm TL is collected from the deeper waters area inside the marine waters of Iraq in 2021. This record is considered the new northern most record of the lutjanid species *Pinjalo pinjalo*, where Kuwaiti waters record was the old northernmost extension. Possibilities for the presence of this species further north in the Indian Ocean have provided.

تسجيل اسماك البنجالو *Pinjalo pinjalo* (Bleeker, 1850) في اقصى شمال المحيط الهندي، من المياه البحرية العراقية

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المستخلص – جمع نموذج واحد من اسماك البنجالو *Pinjalo pinjalo* قياس الطول الكلي له 270 ملم، من المياه البحرية العراقية في شهر ايلول 2021. يعتبر هذا تسجيل جديد للنوع في اقصى شمال المحيط الهندي. وفرت هذه الدراسة الاسباب المحتملة لامتداد انتشار النوع في شمال المحيط الهندي.

كلمات مفتاحية: تسجيل جديد، نطاق النوع، *Pinjalo pinjalo*، الخليج العربي، البصرة.

Introduction

The members of the family Lutjanidae are circumtropical fish species. This family comprises of 17 genera and 110 valid species (Fricke *et al*., 2021). The genus *Pinjalo* is among the small genera of the Lutjanidae family, with only two species, *P. pinjalo* and *P. lewisi* (Randall *et al*., 1987).

Pinjalo pinjalo is a marine species living at depth ranging between 15 and 100 m (Allen and Erdmann, 2012). Adults of this species inhabit reefs and rocky bottoms (Sommer *et al*., 1996). Usually, they form schools in shallow depths of a few meters in open ocean reefs, while they inhabit deeper regions in general (Kuiter and Tonozuka, 2001). Benthic and planktonic invertebrates and to certain extents small fishes form the main food items of *P. pinjalo* (Allen and Erdmann, 2012).

DOI: https://doi.org/10.58629/mjms.v38i1.329.,

The general distribution of this species is in the Indian Ocean, but there are a debate about its presence in the Arabian Gulf and the Red Sea areas. Sivasubramaniam and Ibrahim (1982a, b) was first to report *P. pinjalo* in the Arabian Gulf area; later reported by Allen (1985), Kuronuma and Abe (1986), Randall *et al*. (1987), Carpenter *et al*. (1997), Bishop (2003) and Torquato *et al*. (2017). Fischer and Bianchi (1984) suggesting that this species is not reported from both the Red Sea and the Arabian Gulf, but at the same time they provided a map in the description of this species showing presence of this species in the whole area of the Arabian Gulf and in the middle and southern Red Sea region. Randall (1995) also mentioned that this species is not present in the Arabian Gulf. On the other hand, Allen (1985) presented a distribution map of this species showing its presence in both the Arabian Gulf and the Red Sea. Randall (1997) showed an image of *P. pinjalo* collected from Bahrain. Therefore, the aims of the present study are: 1) to confirm the presence of *P. pinjalo* in the Arabian Gulf; and 2) to report its presence in the Iraqi marine waters, which represent the new northernmost extension of this species in the Indian Ocean.

Materials and Methods

One specimen of P. pinjalo was caught from the deep Iraqi marine waters off the Khor Al-Umia Port city, Basrah (Fig. 1). The fish measured 270 mm TL and 205 mm SL, within the range (300 – 800 mm TL) reported by Allen (1985). The fish was caught using small trawler in September 2021. The specimen was fixed in 10% formalin and later preserved in 70% ethanol for deposit in the fish collection of the Marine Science Centre, University of Basrah, Basrah, Iraq.

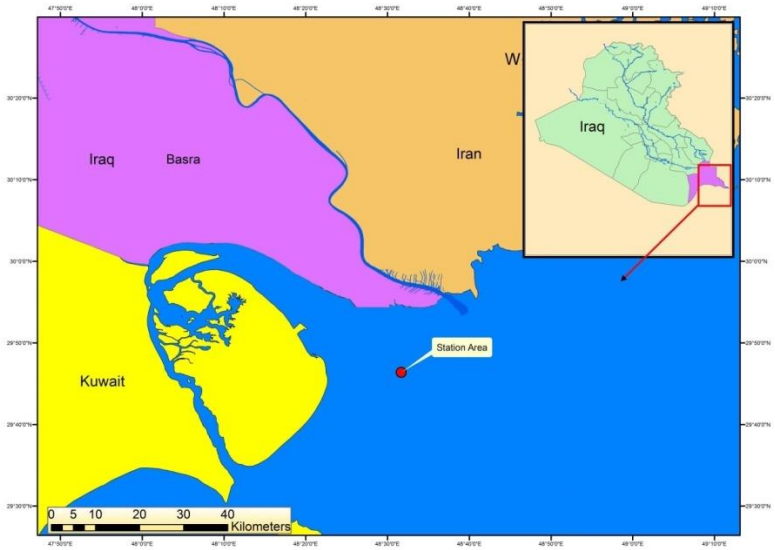

Figure 1. Map showing the sampling locality in the deeper water area within the Iraqi marine waters.

Results

The specimen is identified as *Pinjalo pinjalo* (Fig. 2) by D- XI, 14; A- III, 10; 17 pectoral-fin rays; pelvic fin I, 5; total number of gill rakers 20; total number of lateral line scale 56. Morphometrics (measurements following Hubbs and Lagler, 1958) include body moderately deep (body depth 43.1% in SL); interorbital space strongly convex (interorbital distance 9.18% SL); eye relatively large (eye diameter 7.6% SL); snout relatively short and pointed (snout length 8.2% SL); mouth small, the maxilla reaching below front of eye; dorsal fin 58.5% SL; pectoral

fin length 33.9% SL; anal fin length 18.8% SL; caudal fin length 22.2% SL; predorsal length 32.6% SL; postdorsal fin length 17.3% SL; both dorsal and anal fins with a scaly sheath at base; pectoral fins long, reaching level of anus (Table, 1); caudal fin emarginated; scale rows both above and below lateral line run obliquely toward dorsal profile. Colour: pink or red; whitish or silvery on lower sides and belly; dorsal, anal, caudal and pelvic fins often with black margin; pelvic and anal fins yellowish.

Figure 2. Pinjalo pinjalo 270 mm TL collected from the marine waters of Iraq.

Table 1. Morphometric and meristic characteristics of *Pinjalo pinjalo* from the Iraqi marine waters.

Morphometric characters		% in SL
Total length	270 mm	
Standard length [SL]	205 mm	
Body depth	88.36 mm	43.10
Body width	39.09 mm	19.07
Head length	59.85 mm	29.20
Head depth	57.96 mm	28.27
Head width	31.99 mm	15.60
Snout length	16.82 mm	8.20
Eye diameter	15.54 mm	7.58
Interorbital distance	18.81 mm	9.18
Predorsal length	66.89 mm	32.63
Postdorsal length	35.53 mm	17.33
Dorsal fin length	120 mm	58.54
Anal fin length	38.53 mm	18.80
Pectoral fin length	69.42 mm	33.86

Pelvic fin length		44.03 mm	21.48
Caudal peduncle length		45.60 mm	22.24
Caudal peduncle depth		25.07 mm	12.23
Meristic characters			
Lateral Line		56	
Scales above the lateral line		9	
Scales below the lateral line		17	
Dorsal fin	Spines	10	
	Rays	14	
Anal fin	Spines	3	
	Rays	10	
Pectoral fin rays		17	
Pelvic fin	Spines	1	
	Rays	5	
Gill rakers		20	

Discussion

The TL of the specimen of *P. pinjalo* (270 mm) recorded in the present study was far less than the maximum TL (800 mm) reported by Assadi and Dehghani (1997), but slightly less than the common length (300 mm) given by Allen (1985). The specimen also appeared shorter than that reported by Randall (1995) from Gulf of Oman and from that recorded by Iwatsuki *et al*. (2004) (420 mm TL) from the Kyushu Island, Japan, but longer than the specimen (169 mm TL) reported by Barik *et al*. (2017). Such comparison indicates that the present specimen is young.

Pinjalo lewisi is the only one species in the genus *Pinjalo*. It differs in having XII, 13 dorsal rays and 8-9 anal soft rays (Randall et al., 1987). Also, the scale rows both above and below lateral line run parallel to the lateral line.

The history of the presence of *P. pinjalo* in the Arabian Gulf started with record by Sivasubramaniam and Ibrahim (1982a, b); subsequently reported by Allen (1985), Kuronuma and Abe (1986), Randall *et al*. (1987), Carpenter *et al*. (1997), Bishop (2003) and Torquato *et al*. (2017). Therefore, the information given by Fischer and Bianchi (1984) and that reported by Randall (1995) about the absence of this species in the Arabian Gulf area needs to be taken notice.

Pinjalo pinjalo is previously known from the Kuwaiti waters, this is the previous northernmost record of the species in the Indian Ocean. The collection of one specimen of this species from the Iraqi marine waters represents the new northernmost record of this species in the Indian Ocean.

The presence of *P. pinjalo* further north in the Arabian Gulf and into the Iraqi marine waters can explained on the bases of three ideas, First, the species is already present in the Iraqi marine waters, but the lack of ichthyologic explorations precents catching this species before. Second, a natural range extension as a result of changes in the marine factors such as winds, marine currents and larval flow and looking for food. Dispersal capabilities depend on the mobility of the larval and young stages, where with the latter form the mobility is very high. In the marine environment there are records of invasive fish species (De Roy *et al*., 2020a, b). Third, is the human activity caused introduction of one or more phases of the life cycle of *P. pinjalo*?. This possibility can be

seen in the transfer via ship ballast water and dispersal during the larval phase (Wonham *et al*., 2000, Brito *et al*., 2011, Galil *et al*., 2011). Many small benthic marine fishes, chordate species, small-sized invertebrates and plankton (introduced as eggs, larvae or juveniles) are first recorded from regions with major commercial ports, and the method of transport associated is via the large amounts of ballast water carried by international shipping (Wonham *et al*., 2000, Lockett and Gomon, 2001) or ship's hull fouling (Cuesta *et al*., 2016). The 2nd and 3rd possibilities look feasible to explain the presence of *P. pinjalo* in the marine waters of Iraq. It seems that larvae of *P. pinjalo* have attracted to further north by the presence of food in the Iraqi marine waters. Such nutrients are usually delivered by Shatt al-Arab River (Al-Faisal and Mutlak, 2014).

Conclusion

Catching of more specimens of *P. pinjalo* in the marine waters of Iraq will explain the actual reason/s behind the catch of the single specimen reported in the present study and to show whether this species will be successful to initiate a sustainable population.

Acknowledgement

We would like to express our heartfelt gratitude to Prof. Laith A. Jawad for his substantial contribution to the completion of this work.

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