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First record of the Rosy goatfish, *Parupeneus rubescens* (Lacepede, 1801) (Mullidae) in Syrian marine waters

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Abstract

This paper discusses the first documented record of the Rosy goatfish *Parupeneus rubescens* in Syrian coastal waters. A specimen (200 mm TL) was captured on 21st May 2020, using trammel nets at a depth of 120 m. in the Ras al-Basit region, 60 km north of Lattakia (35°50′ N, 35°50′E). Morphological and taxonomic analysis showed that the type of individual described in the present work is a newly introduced species of Indo-Pacific origin to the area, identified as P. rubescens (Lacepede, 1801). It should be noted that this species was monitored with individuals of the species *Parupeneus forsskali* in the framework of our research project on the biology of the Mullidae family in the Syrian marine waters. The number of Lessepsian fish migrants in the Syrian marine waters has reached 82 species.

Key words: Lessepsian migrant, *Parupeneus rubescens*, Eastern Mediterranean, Syrian marine waters.

Introduction

The biological invasion of Indo-pacific species into the Mediterranean was unknown before the opening of the Suez Canal in 1869. The Levantine Basin of the Eastern Mediterranean is the first recipient of the Lessepsian invaders of Eritrean and Indo-Pacific species. The hydrological properties of the Levantine seawater, displaying a high salinity and temperature with a critical oligotrophy, are close to those of the Red Sea and show certain subtropical affinity (Lakkis and Sabour, 2014).

The family, Mullidae consist of 6 genera and 101 species which are distributed in the Atlantic, Indian and Pacific Oceans (Fricke *et al*., 2021). All goatfishes are marine species; living mostly in sand, muddy sand or gravel bottoms at depths ranging from 10 to 120 m (Nelson, 2016). In the Syrian marine waters five species

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were recorded, the indigenous *Mullus barbatus* (Linnaeus, 1758) and *Mullus surmuletus* (Linnaeus, 1758); the migrants *Upeneus moluccensis* (Bleeker, 1855); *Upeneus pori* (Ben-Tuvia 1989); and *Parupeneus forsskali* (Fourmanoir and Guézé , 1976) of Indo-Pacific origin (Ali., 2018; Ali *et al*., 2016; Saad, 2005).

Rosy goatfish *Parupeneus rubescens* (Lacepede, 1801) is distributed in the Indo-West Pacific from the Red Sea and the Persian Gulf, extending to South Africa, the Western Pacific, and Southeast Atlantic. It is recognized by a pale-edged dark brown band from the front of the snout through the eye and continuing a short distance anteriorly on the body along the lateral line. It is found on sandy bottoms and murky areas of coastal waters (Barman and Mishra, 2007; Springbok–Njokweni, 2015).

In this paper, the species *P. rubescens* is reported for the first time from Syrian waters off the Lattakia coast**.**

Material and Methods

One specimen of species *P. rubescens* was caught on 21 May 2020 by a commercial trammel net, at a depth of 120 m, over a sandy bottom, off Rass Al Bassit, a locality situated 60 km north of Lattakia (35°50′ N, 35°50′E) (Fig. 1). The specimen was measured to the nearest mm and weighed to the nearest g, morphometric measurements, including standard length percent (%SL), and meristic counts were performed according to Barman and Mishra (2007). Fish sample was preserved in 10% buffered formalin and deposited in the Ichthyological Collection of the Marine Sciences Laboratory, Agriculture Faculty at Tishreen University, Syria.

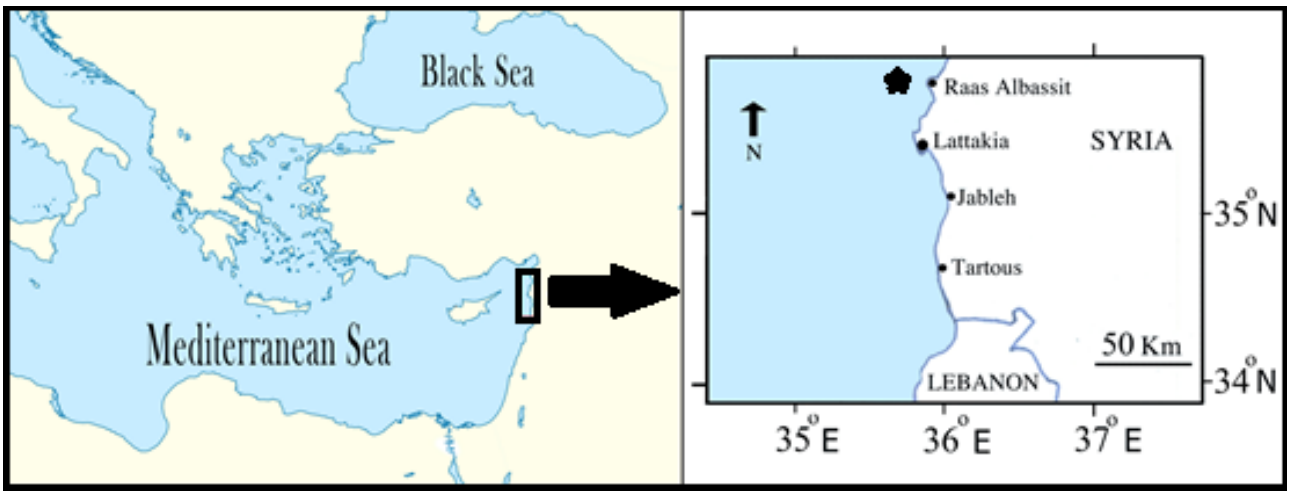

Fig. 1. Map of indicating the capture site of *Parupeneus rubescens.*

Results and Discussion

Materials examined

Morphometric and meristic data of the new Lessepsian migrant specimen are given in Table 1. It was identified as *P. rubescens* from the combination of main morphological characters (Fig. 2).

Morphological description

Body deep, compressed. Chin with a pair of thin barbells, reaching almost to the rear margin of opercula. Mouth small; a single row of well-spaced, stout, conical teeth in jaws, no teeth on roof of mouth. Two widely separated dorsal fins, first with 8 spines, the first spine small and third spine longest. The last dorsal and anal fin rays elongate; the third anal fin ray is longer than the last one. Pectoral fins with 16 rays. Lateral line with 29 scales. The body color is reddish to greenish brown dorsally, shading light red ventrally. There is also a pale-edged dark brown band from the front of the snout through the eye and continuing a short distance anteriorly on the body along the lateral line. A large black spot located dorsally on *P. rubescens* was found and identified while sampling fish in the framework of the *P. forsskali* biology study project.

Figure 2. The specimen of *Parupeneus rubescens* caught off Syrian coast

Table 1: Morphometric and meristic characteristics and weight data of *Parupeneus rubescens* type.

Morphometric measurements	**Measure (mm)**	**%SL**
Total length (TL)	200	129.87
Fork length (FL)	168	109.09
Standard length (SL)	154	
Body depth	35	14.29
Head length	47	30.52
Snout length	22	14.29
Eye diameter	11	7.14
Postorbital length	29	18.83
Predorsal - 1 length	58.5	37.99
Predorsal - 2 length	97	62.99
Length of Dorsal fin	70	45.45
Length of the 1st dorsal fin	29	18.83
Length of the 2nd dorsal fin	28.5	18.51
Prepectoral length	50	32.47
Preanal length	96	62.34
Length of anal fin	20	12.99
Pelvic fin length	28	18.18
MERISTIC COUNTS		
Scales on lateral line	29	
Dorsal fin rays	VIII+ 9	
Anal fin rays	I+ 6	
Pelvic fin rays	I + 5	
pectoral fin rays	16	
TOTAL WEIGHT (g)	67.8	

Remarks

The new species was distinguished from *P. forsskali* by a light brown band running from front of snout to a short distance anteriorly on body along a lateral line while in *P. forsskali* it was a well-marked black stripe from front of snout ending below rear base of second dorsal fin. It is then considered that *P. rubescens* migrated with its congener *P. forsskali* from the Indian Ocean through the Red Sea and Suez Canal to the eastern basin of the Mediterranean Sea, where it was

reported to be present in the Egyptian waters of the Red Sea (Farrag *et al*., 2018). The new migrant fish *P. rubescens,* cannot be confused with *P. macronema*, because the latter is characterized by the presence of a second dorsal fin with a clear black base, and a black stripe extending from the eye area to the end of the dorsal fin, **(**Barman and Mishra, 2007; Koeda and Ho., 2018). Another species *P. barberinus* is widespread in the Red Sea and it has not been recorded in the Mediterranean so far it is characterized by the presence of a black spot in the middle of the caudal peduncle (Springbok–Njokweni, 2015**)** whereas it appears larger and located dorsally on the posterior part of caudal peduncle above the lateral line in *P. rubescens*. The *P. rubescens* has been distinguished from other species of the genus *Parupeneus* according to Table 2.

The increasing migration of fish from the Indian and Pacific oceans to the Eastern Mediterranean including the Syrian sea waters showed that some of them (*Lagocephalus guentheri*, *Torquigener flavimaculatus*, *Fistularia* commersonii) affected negatively the original biodiversity, and the local fish stock, as they became invasive; indeed they reproduced and settled in Syrian coastal waters, and were uneconomic and even poisonous (Saad, 2005; Sabour *et al*., 2014; Sabour and Masri, 2018; Ali, 2018), Some migrants fed on fish and their larvae which threatened some types of local fish conducting to their extinction and the lacking their stocks (Khalaf *et al*., 2014). However, some invasive migratory fish showed a positive impact because they are economic and desirable to the consumers, such as the migratory *Upeneus moluccensis*, *U. pori* and *Parupeneus forrskali* (Ali *et al*., 2016; Ali, 2018).

Conclusion

This study indicates the first registration of *P. rubescens* in the Syrian marine waters, but the extent, the ability to form communities and stability of this species on our coasts are currently investigated.

Table 2. Comparison of Red Sea and Mediterranean species of the *Parupeneus rubescens*.

	Parupeneus rubescens	***Parupeneus forsskali***	***Parupeneus macronemus***	***Parupeneus barberinus***
Dorsal fin rays	VIII , 9	VIII , 9	VIII , 9	VIII , 9
Anal fin rays	I+ 6	I+ 6	I+ 6	I+ 6
Pelvic fin rays	I + 5	I + 5	I + 5	I + 5
pectoral fin rays	16	14-17	15-17	16-18
The black spot at end of body	Black spot on caudal peduncle	Irregular circular black spot, mostly above lateral line	A round black spot larger than eye on the side of the peduncle about two-thirds above lateral line	A black or red spot larger than eye in middle of the base of caudal fin
Tape color and position	light brown stripe running along body from The nose area to second dorsal fin	A wide black stripe from the side of the upper lip across the eye along the upper side of the body, ending just below back of second dorsal fin	Black stripe from the eye along lateral line to the anterior part of the caudal peduncle	Dark brown to black stripe from the upper lip across the eye to the lower back of second dorsal fin
Second dorsal fin color	Fins are light in color with yellow interspersed	Fins are light in color	Pale area at end of the black stripe and basal stripe darker in the second dorsal fin	Fins are light in color
Species				
	This study	This study	Farrag *et al.*, 2018	Farrag *et al.*, 2018

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أول تسجيل لسمكة الماعز الوردي *Parupeneus rubescens* (Lacepede, 1801) (السلطانيات) في المياه البحرية السورية

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المستخلص

تناقش هذه الورقة أول تسجيل موثق لسمكة الماعز الوردية *Parupeneus rubescens*، في المياه البحرية السورية. تم التقاط عينة بطول كلي (200 سم) في 21 أيار 2020 باستخدام الشباك المبطنة على عمق 120 م، في منطقة رأس البسيط تبعد 60 كم شمال اللاذقية (35 ° 50 ′ شمالاً ، 35 ° 50 شرقاً). أظهر التحليل الشكلي والتصنيفي أن النوع الموصوف في العمل الحالي هو نوع جديد دخل من المحيطين الهندي والهادي إلى المنطقة، وتم تحديده على أنه سمكة الماعز الوردي *P. rubescens* (Lacepede, 1801). وتجدر الاشارة إلى أن هذا النوع قد تم رصده مع أفراد من النوع *Parupeneus forsskali* في إطار مشروعنا البحثي حول بيولوجيا فصيلة السلطانيات (Mullidae) في المياه البحرية السورية. وصل عدد الأسماك الليسبسيانية المهاجرة في المياه البحرية السورية إلى 82 نوعًا.

الكلمات المفتاحية: الهجرة الليسبسيانية، *Parupeneus rubescens*، شرق المتوسط، المياه البحرية السورية.