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Occurrence of the Red Sea Goatfish *Parupeneus forsskali* (Fourmanoir & Guézé, 1976) from the Western Mediterranean Coast of Turkey**Türkiye'nin Batı Akdeniz Sahillerinden Kızıldeniz Barbunu *Parupeneus forsskali* (Fourmanoir & Guézé, 1976)'nin Bulunuşu**

Türk Denizcilik ve Deniz Bilimleri Dergisi

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Ayhan ALTUN¹**¹Marine Science and Technology Faculty, Iskenderun Technical University, Iskenderun-Hatay, Turkey²Kahta Vocational School, Adyaman University, Kahta, Adyaman, Turkey³Imamoglu Vocational School, Cukurova University, Imamoglu, Adana, Turkey**ABSTRACT**

Three specimens of the Red Sea goatfish *Parupeneus forsskali* were recorded from two locations at a depth of 12-18 m. One was observed during the SCUBA diving in Fethiye Bay on 15 June 2016 and the other two were collected via trawling during a benthic survey in Aydıncık coast on 24 December 2016. *P. forsskali* was first recorded in the Mediterranean coast of Turkey twelve years ago. This lessepsian species appears to be continually spreading

and easily establishing new populations in the Mediterranean Sea coast of Turkey. Our study indicated the westward expansion of *P. forsskali* along to Mediterranean coasts. The present study also investigated the way of introduction and possible depths of its spread in the Mediterranean Sea.

Keywords: Mullidae, Lessepsian, Aydıncık coast, Fethiye Bay, Turkey

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ÖZET

Parupeneus forsskali'nin üç bireyi 12-18 m derinliklerden iki bölgeden kaydedilmiştir. Birinci birey 15 Haziran 2016 tarihinde SCUBA dalışı sırasında Fethiye Körfezi'nden gözlenmiş, diğer iki birey 24 Aralık 2016'da Aydıncık sahilinde yapılan bentik bir tarama sırasında trol ile örneklenmiştir. *P. forsskali* ilk olarak on iki yıl önce Türkiye'nin Akdeniz kıyılarında kaydedildi. Bu lessepsiyen türler, sürekli yayılmakta ve Türkiye'nin Akdeniz kıyılarında kolaylıkla yeni popülasyonlar oluşturabilmektedir. Çalışmamız, *P. forsskali*'nin batıya doğru genişlemesini Akdeniz kıyılarında göstermiştir. Bu çalışmada ayrıca bu türün Akdeniz'deki dağılım alanları ve muhtemel bulunduğu derinlikler kaydedilmiştir.

Anahtar sözcükler: Mullidae, Lessepsiyen, Aydıncık sahili, Fethiye Körfezi, Türkiye

1. INTRODUCTION

The Red Sea goatfish *Parupeneus forsskali* (Fourmanoir and Guézé, 1976) is a tropical fish species distributed throughout the Red Sea and Gulf of Aden region (Randall, 2004; Randall and Heemstra, 2009; Froese and Pauly, 2017). The Red Sea goatfish usually found on sand bottoms near coral reefs (Kumaran and Randall, 1984). It commonly feeds on invertebrates (Hobson, 1974). The introduction of this species in the Mediterranean Sea was thought to be via the Suez Canal. First encounter of this species in the eastern Mediterranean Sea was reported from Taşucu-Mersin, Turkish coast of Mediterranean Sea as a result of observation carried out between 2000 and 2004 (Cınar et al., 2006). Eventually, Yağlıoğlu and Ayas (2016) have also indicated the presence of the species in the same region. Recent studies indicated that this species successfully inhabited different locations in the eastern Mediterranean and reports from Iskenderun Bay (Gürlek et al., 2016) and Antalya Bay (Gokoglu and Teker, 2016) of Turkey, and coast of Israel (Sonin et al., 2013), Lebanon (Bariche et al., 2013) and Cyprus (Chartosia and Michailidis, 2016) and Syria (Ali et al.,

2016) and finally Mugla coast and Rhodes (Yapici and Filiz, 2017; Kondylatos and Corsini-Foka, 2017).

Evidential range expansion of the species indicated a quick establishment of the populations of *P. forsskali* in the Mediterranean Sea. Relatively rapid range extension of the species was confirmed as a results of this study with the addition of two new locations; Aydıncık in Mersin Bay and Fethiye Bay. This is the first confirmation of the presence of *P. forsskali* in the western coast of Turkey.

2. MATERIAL AND METHOD

One specimen of *P. forsskali* was observed and photographed during the diving and benthic surveys in Fethiye coast in southern Aegean on 15 June 2016 at a depth of 12 m (Figure 1). Another two specimens of *P. forsskali* were captured by a commercial trawler at a depth 18 m in Aydıncık coast (Mersin), (36° 07' 38" N; 33° 19' 44" E) on 24 December 2016 (Figure 2). All measurements were made with a digital caliper. The weight was measured with a precision scale of 0.01 g. Morphological and taxonomic descriptions and color of the captured specimens were

given according to Bariche *et al.* (2013), Sonin *et al.* (2013) and Gürlek *et al.* (2016).



Figure 1. Underwater observations of *Parupeneus forsskali* from Fethiye coast (western Mediterranean Sea, Turkey) in June 2016



Figure 2. Two Red Sea goatfish, *Parupeneus forsskali* caught off Aydıncık coast (North-eastern Mediterranean Sea, Turkey) in December 2016

3. RESULTS

The descriptions of three specimens from Fethiye and Aydıncık were similar to that of those reported from Turkey (Cınar *et al.*, 2006; Gürlek *et al.*, 2016), Lebanon (Bariche *et al.*, 2013) and Israel (Sonin *et al.*, 2013). Morphometric data of two specimens obtained from fishing were shown in Table 1. Data on the occurrence of *P. forsskali* in the Mediterranean Sea is summarized in Table 2.

This species is characterized by a single black stripe starting from tip of snout, passing through eye and ending at the end of second dorsal fin base. There is also a black spot on caudal peduncle and the lower edge of the spot is placed just above the lateral line.

Color: Body below the stripe is white; the scale edges are narrowly reddish. The background color at dorsal is pinkish. The first dorsal, pectoral and ventral fins also have a pink color while the second dorsal, anal and caudal fins are rather yellowish.

4. DISCUSSIONS

Current data indicated that the occurrence of *P. forsskali* is more common in the Mersin Bay than in Iskenderun Bay or Fethiye Bay. This observation suggests that the habitat in Mersin Bay is more favorable for the reproduction of the species (Ben Rais Lasram *et al.*, 2010).

Existing records of this lessepsian species suggest that *P. forsskali* migrate westward from the eastern Mediterranean Sea coast of Turkey. Our study confirms westward extension of *P. forsskali* along the Mediterranean Sea to southwestern Mediterranean Sea coasts of Turkey.

5. CONCLUSIONS

The result of observation suggests that *P. forsskali* is expanding their distribution and establishing new populations all around Mediterranean coast of Turkey. Furthermore, Mersin and Fethiye coast seem to be favorable niches for the rapid range extension of this species. It is important that the establishment of this lessepsian fish species has to be monitored closely with further studies in order to determine the effect of the presence of the species to local populations and Mediterranean ecosystem.

Table 1. Morphometric measurements of the specimen of *Parupeneus forsskali* from Aydıncık coast, Turkey. Morphometric measurements as proportions (%) are given in parentheses.

Measurements (mm)	Specimens	
	1	2
Samples	1	2
Sex	♀	♀
Metrics		
Total length	152.00	114.40
Fork length	138.03	99.84
Standard length	129.65	91.46
Body depth	30.95	23.88
Head length	38.46	25.83
Eye diameter	7.31	6.95
Pre-anal length	79.31	55.08
Pre-pelvic length	39.92	27.88
Pre-pectoral length	40.65	30.31
Pre-orbital length	18.78	11.51
Pre-dorsal length	41.36	29.76
Meristics		
Dorsal fin ray (D ₁)	VIII	VIII
Dorsal fin ray (D ₂)	9	9
Anal fin ray (A)	7	7
Ventral fin ray (V)	I+5	I+5
Pectoral fin ray (P)	13	14
Weight (g)	40.15	15.20

Table 2. Review of *P. forsskali* species from different sampling area

References	Record Date	Location	Country	Depth (m)	Total Length (mm)
Cinar <i>et al.</i> (2006)	2000	Taşucu, Mersin	Turkey	150	-
Cinar <i>et al.</i> (2006)	2004	Mersin	Turkey	-	-
Bariche <i>et al.</i> (2013)	2012	Beirut	Lebanon	40	209
Sonin <i>et al.</i> (2013)	2013	Haifa	Israel	45	175
Gürlek <i>et al.</i> (2016)	2015	Iskenderun Bay	Turkey	30	231
Yağlıoğlu and Ayas (2016)	2015	Yeşilovacık Bay	Turkey	100-110	190
Ali <i>et al.</i> (2016)	2015	off Jableh	Syria	30	205
Gokoglu and Teker (2016)	2016	Gulf of Antalya	Turkey	8-10	-
Yapici and Filiz (2017)	2016	off Turunç, Mugla	Turkey	10	-
Kondylatos and Corsini-Foka (2017)	2016	Rodos	Greece	5-30	93.5-108.6
Present study	2016	Aydıncık	Turkey	55	152.0-114.4
Present study	2016	Fethiye	Turkey	12	-

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