

## Rapid Communication

## Confirmed presence of the Red Sea goatfish *Parupeneus forsskali* (Fourmanoir & Guézé, 1976) in the Mediterranean Sea

Michel Bariche<sup>1\*</sup>, Murat Bilecenoglu<sup>2</sup> and Ernesto Azzurro<sup>3</sup>

<sup>1</sup> Department of Biology, Faculty of Arts and Sciences, American University of Beirut, PO Box 11-0236, Beirut, Lebanon

<sup>2</sup> Department of Biology, Faculty of Arts and Sciences, Adnan Menderes University, 09010 Aydin, Turkey

<sup>3</sup> ISPRA, National Institute for Environmental Protection and Research, Piazzale dei Marmi 2, 57128 Livorno, Italy

E-mail: [michel.bariche@aub.edu.lb](mailto:michel.bariche@aub.edu.lb) (MB), [mbilecenoglu@yahoo.com](mailto:mbilecenoglu@yahoo.com) (MB), [eazzurr@gmail.com](mailto:eazzurr@gmail.com) (EA)

\*Corresponding author

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### Abstract

On 28 December 2012, a single specimen of the Red Sea goatfish *Parupeneus forsskali* was captured north of Beirut (33°55.472'N; 35°34.654'E) (Lebanon, eastern Mediterranean Sea). This species has been recorded earlier by visual sighting in only one Mediterranean location, in the vicinity of Mersin (Turkey). The most likely pathway for this Red Sea region endemic fish is the passage through the Suez Canal.

**Key words:** Forsskal's goatfish; alien species; Lessepsian migration; Lebanon; eastern Mediterranean

### Introduction

Goatfishes (Mullidae) constitute a family of marine fish species that are commercially important. They can be easily recognized by the presence of a pair of long movable hyoid barbels on the chin (Randall 1983; Ben-Tuvia 1986; Nelson 2006). The family consists of six genera and about 62 species are present in the Atlantic, Indian and Pacific oceans (Nelson 2006). Five species of goatfishes are present in the Mediterranean Sea: the indigenous *Mullus barbatus* Linnaeus, 1758 and *M. surmuletus* Linnaeus, 1758; the exotic *Upeneus moluccensis* (Bleeker, 1855) and *U. pori* Ben-Tuvia and Golani, 1989 of Indo-Pacific origin; and *Pseudupeneus prayensis* (Cuvier, 1829) from the Atlantic (Reina-Hervás 1987; Golani 1994; Azzouz et al. 2011).

The Red Sea goatfish or Forsskal's goatfish *Parupeneus forsskali* (Fourmanoir & Guézé, 1976) is endemic to the Red Sea and Gulf of Aden (Randall 1983, 2004). It is recognized by a black stripe, which runs from the tip of its snout, through the eye, along the lateral line, and

ending beneath the rear of the second dorsal fin. A black spot is also present on the upper side of the caudal peduncle (Randall 1983, 2004). It is a common fish living on sandy bottoms and coral reefs of the Red Sea and can reach 28 cm in length (Golani 1999; Al-Rousan et al. 2005). The species has been previously visually sighted underwater in the Mediterranean (Çinar et al. 2006).

### Methods

Measurements and counts followed Kottelat and Freyhof (2007). Most diagnostic features were observed under a dissecting microscope and all measurements were made with a digital caliper.

### Results

On 28 December 2012, a single specimen of *Parupeneus forsskali* (209 mm TL; 165 mm SL) was captured in a trammel net, north of Beirut (33°55.472'N; 35°34.654'E). The net was set at around 40 m over hard bottom. All descriptive characteristics, measurements and counts were



**Figure 1.** *Parupeneus forsskali* (AUBM OS 3889) captured north of Beirut (33°55.472'N; 35°34.654'E) in Lebanon (eastern Mediterranean). Scale Bar 2 cm. Photograph by Michel Bariche.

similar to the description of the species in the literature (Al-Absy 1988; Ben-Tuvia and Kissil 1988; Khalaf and Disi 1997; Çinar et al. 2006). The specimen was deposited in the marine collection of the American University of Beirut (AUBM OS 3889).

*Description of the specimen from Lebanon (Figure 1):*

Body oblong, moderately compressed, its depth 4.1 in SL. Head length (HL) 3.4 in SL; snout length 1.9 in HL, barbel length 1.5 in HL; pectoral fin length 1.4 in HL; pelvic fin length 1.4 in HL; penultimate dorsal ray 1.1 in length of last dorsal ray. Dorsal fin VIII, 9, the longest dorsal spine 1.6 in HL; anal fin I, 7; pectoral fin 16; caudal fin forked. Lateral line with 32 large scales, extending on caudal fin; gill rakers 7+21. One row of teeth on both jaws, not visible when mouth is closed. No teeth on vomer and palatines.

Fresh specimen colour: The back ground colour is red. Greyish on back and silvery to white ventrally. A yellow patch on dorsal side of the caudal peduncle, with a distinct black spot on its upper side, touching the lateral line from below. A prominent black stripe extending from the tip of the snout through the eye and along the lateral line, and ending beneath the rear of the

second dorsal fin. First dorsal, pectoral and pelvic fins are reddish. Second dorsal, anal and caudal fins are yellowish.

### Discussion

Members of the genus *Parupeneus* were previously recorded from different parts of the Mediterranean, but none of these sightings were considered reliable since they were not associated with a captured specimen, a photograph or valid taxonomic description; i.e. eastern Levant records of *Parupeneus barberinus* (CIESM 2009), the Gozo/Maltese islands record of *Parupeneus* sp. (alleged to be *P. barberinus* or *P. forsskali*; no concrete data is available for a precise identification) (Sciberras and Schembri 2007).

Two Mediterranean sightings of the Red Sea goatfish *Parupeneus forsskali* have been reported so far: In 2000, one individual was observed off Mersin (Turkey) and a second specimen was photographed four years later in the same location (Çinar et al. 2006). Therefore, the collected specimen from Lebanon represents the third record of *P. forsskali* in the Mediterranean Sea and confirms the presence of the species in the basin.

Lessepsian fishes are usually first recorded in countries situated in the vicinity of the Suez Canal, between Egypt and Lebanon. In this respect, the sudden appearance of the species from Mersin, which is separated by about 900 km of coasts from the canal, was misleading. Çınar et al. (2006) emphasized the passage through the Suez Canal, as a mode of introduction to the Mediterranean Sea. However, other vectors such as ballast water transport or aquarium release cannot be excluded. A survey made among aquarium traders since 2000 revealed that no exotic goatfish was among imported live fish to Turkey (M. Bilecenoglu, pers. comm.). The collected specimen from Lebanon, in addition to the fact that *P. forsskali* is endemic to the Red Sea region, confirms the species as a Lessepsian migrant, which may have been overlooked in the Levantine coast.

The sporadic occurrence of some Lessepsian species in the Mediterranean is interesting to highlight. The presence of those species is sometimes restricted to only few individuals collected and years can pass between two subsequent records (CIESM 2009). This is the case of *Heniochus intermedius* (Chaetodontidae) and *Platycephalus indicus* (Platycephalidae) reported by Bariche (2012). *Parupeneus forsskali* is a similar species, for which only three specimens have been recorded since 2000 (Çınar et al. 2006; present study). These occurrences, well separated in time and space, might be related to the presence of small populations that are difficult to detect or to unrelated entries of pioneer individuals. Recent changes in the Mediterranean (Ben Rais Lasram et al. 2010) and the overcome of necessary time lags (Crooks 2011) may allow *P. forsskali* to become more successful in the future. As for most goatfishes, the species is commercially important in its native habitat (Al-Absy 1988; Khalaf and Disi 1997), and it could be exploited by the Mediterranean fishery, as it is the case for *Upeneus moluccensis* and *U. pori* in the Levant (Golani 1994). However, the ecological consequences of such possible success, particularly in terms of competition and niche partitioning with native and other non-indigenous goatfishes should be studied further.

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