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— SHORT COMMUNICATION —

Apogon queketti (Apogonidae) in the Aegean Sea

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Many non-indigenous species have been found during decades in the Aegean Sea and many of them have rapidly established. In this study we report the presence of the spotfin cardinal fish (*Apogon queketti* Gilchrist, 1903) for the first time in the Aegean Sea. This is also the first record of the Lessepsian apogonid fish for the Aegean Sea.

Key words: Lessepsian immigration, spotfin cardinal fish, south Aegean Sea.

INTRODUCTION

In 1947, *Apogon pharaonis* Bellotti, 1874 (Apogonidae) was reported as the first alien cardinal fish from the coast of Palestine in the Mediterranean Sea (Haas & Steinitz, 1947). About six decades later, three additional species, *A. queketti* Gilchrist, 1903 (Eryilmaz & Dalyan, 2006), *A. smithi* (Kotthaus, 1970) (Golani *et al*., 2007) and *A. fasciatus* (White, 1790) (Goren *et al*., 2009) were recorded. Eventually, one native species (*A. imberbis*) and four alien species constitutes the apogonid fish fauna in the Mediterranean basin.

Apart from the native species *A. imberbis*, three out of the four alien species of the cardinal fish have already been known from the Turkish waters. Gucu *et al*. (1994) and Oz *et al*. (2007) reported the species *A. pharaonis* from the Cilician basin and Datca-Bozburun Peninsula, respectively. *Apogon smithi* was recorded only from Iskenderun Bay (Goren *et al*., 2008), while two records of *A. queketti* were given by Eryilmaz & Dalyan (2006) and Gokoglu *et al*. (2011) from Iskenderun Bay and Antalya Bay, respectively.

Here we report the spotfin cardinal fish (*Apogon queketti*) for the first time from the Aegean Sea, being the first Lessepsian apogonid fish record for the Aegean Sea.

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MATERIALS AND METHODS

On December 24th 2009, a single specimen of *A. queketti* was captured by a commercial bottom trawl ship (22.6 m length, 485 HP, equipped with traditional Ottoman type trawl net) at a depth of 52 m (on sandy and muddy bottom) in Ekincik Bay (SE Aegean Sea). The trawl route was: 36° 48′ 977″ N - 28° 33′ 317″ E / 36° 47′ 250″ N - 28° 35′ 420″ E (Fig. 1). The specimen was fixed in 96% alcohol, deposited in the Faculty of Fisheries Museum Collection, Mugla Sitki Kocman University, and received the catalogue number MUSUM/PIS/2010-1. Metric characters of the specimen were measured with a digital calliper (to the nearest 0.01 mm), whereas the meristic characters were counted under a stereo zoom microscope having × 20 magnification.

RESULTS AND DISCUSSION

For the description of the specimen we followed the counts and morphometric measurements given by Gon & Randall (2003). All measurements, morphological descriptions as well as the color were compatible with the descriptions of Eryilmaz & Dalyan (2006) and Gokoglu *et al*. (2011) (Table 1).

Diagnosis

Fourth dorsal-fin spine longer than 3rd spine; first dorsal-fin spine not distinctly more robust than other spines; preopercle edge and ridge smooth; developed gill rakers on upper limb 2; large dark spot on rear

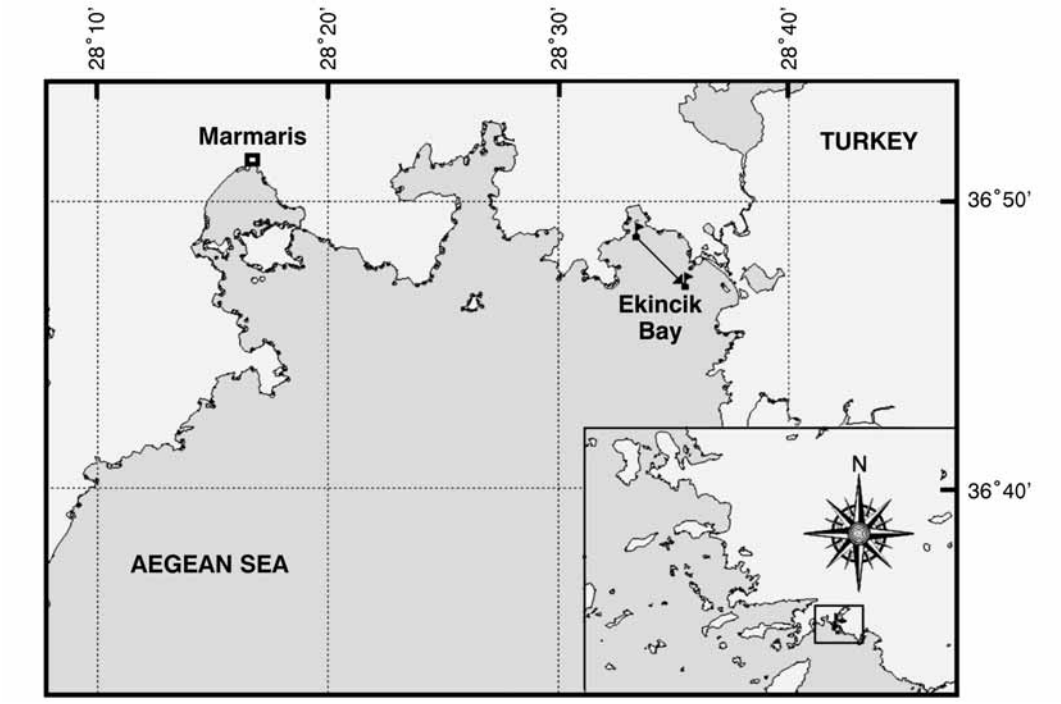

FIG. 1. Map showing the location where sampling was carried out. Lines indicate true trawl coordinates.

part of first dorsal fin; body with dark brown spot on scales, forming longitudinal rows; peritoneum pale.

Post-mortem coloration

Freshly caught specimen: pinkish grey dorsally, shading to silvery on both sides and ventrum, but otherwise as described above; spot on first dorsal fin (from third spine to seventh spine) and distal edge of anal fin intense black; edge of second dorsal and caudal fins blackish.

Preserved sample (Fig. 2): top of head and snout sometimes dark brown; body pale brown to brown, usually with series of spots that may form irregular, sinuous lines; scales above lateral line with dark edge; dusky cheek and temporal marks present or absent; large dark brown to black spot on posterior part of first dorsal fin; second dorsal, anal, and caudal fins pale to dusky, with dark distal edge; sometimes second dorsal and anal fins with faint dark stripe, at mid-level and along base, respectively, which gradually darken posteriorly; other fins pale, but brown spots sometimes present along pelvic rays (not on membranes); peritoneum and intestine pale.

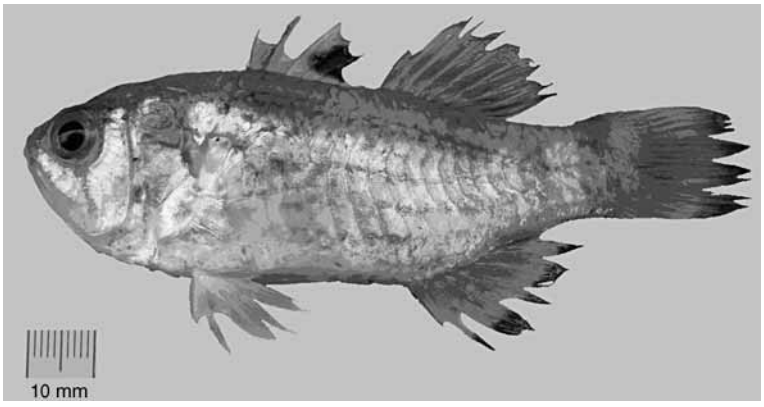

FIG. 2. Photograph of *Apogon queketti* caught in Ekincik Bay, December 2009.

TABLE 1. Measurements of *Apogon queketti* compared with specimens caught off Iskenderun Bay (A: Eryilmaz & Dalyan, 2006) and Antalya Bay (B: Gokoglu *et al*., 2011)

Parameters	A	B	Present study
n	2	2	1
Weight (g)	–	7.4-19.8	–
Total length, TL (cm)	10.2-11.1	7.4-10.4	10.5
Standard length, SL (cm)	8.5-9.1	6.0-8.8	8.3
Head length, HL	2.4-2.8 (in SL)	2.2-3.1	2.8
Snout Length	3.7-4.5 (in HL)	–	0.6
Maximum Body Depth	2.7 (in SL)	–	2.9
Maximum Body Width	–	2.2-3.0	1.4
Eye diameter	3.3-3.6 (in HL)	0.8-0.9	0.8
Interorbital distance	3.3-3.6 (in HL)	–	0.9
Snout to D1	–	–	3.1
Snout to D2	–	–	5.1
Snout to A	–	–	5.5
Snout to Pectoral	–	–	3.2
Snout to Pelvic	–	–	2.8
Pectoral Length	–	–	1.8
Pelvic Length	–	–	1.6

The captured specimen was a mature female of 105.07 mm total length (TL) (Fig. 2). Gonads were examined macroscopically and determined as stage III (according to Holden & Raitt, 1974). Meristic data of our *A. queketti* are: D1, VII; D2, I + 9; A, II + 8; P, 15; V, I + 5-6; LL, 25 + 1; median predorsal scales 3; developed gill rakers 2 (on upper limb) + 10 (on lower limb). The distinguishing morphometric characteristics of *A. queketti* specimen were compared with the previous records of the species along the Turkish coasts (Table 1).

Remarks

Based on the previous records of *A. queketti*, it seemed to limit its expansion rate in the Levantine coasts. However the present report further extends its distribution range to SE Aegean Sea.

In order to evaluate the establishment success of the Lessepsian species, information on reproduction of the species are needed. Eryilmaz & Dalyan (2006) found that one of the collected *A. queketti* specimens (female, 111 mm TL) in the Iskenderun Bay, Turkey, had mature gonads, which was the case in our study as well, suggesting that a breeding population could become established.

The first *A. queketti* record in the Mediterranean was given by Eryilmaz & Dalyan (2006) from Iskenderun Bay (55-60 m depth; sandy and muddy bottoms). The second record was given by Goren *et al*. (2009) for the Israeli Mediterranean shores (20-70 m depth; sandy-mud and muddy bottoms) and the third by Gokoglu *et al*. (2011) from Antalya Bay (140-150 m depth; sandy-mud and muddy bottoms). We found *A. queketti* at the depth of 52 m on sandy and muddy bottom. Apogonid Lessepsian fish species reported from the Mediterranean Sea inhabit muddy to sandy bottoms which is the habitat they prefer in the Red Sea or in other areas of their distribution (Golani *et al*., 2008). Golani *et al*. (2008) report that the presence of continuous soft-bottom substratum from the Gulf of Suez to SE Mediterranean Sea favours migration of dwellers of such habitats as observed from their rapid rate of colonization.

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