

Marine Record

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First record of the Western Atlantic cocoa damselfish *Stegastes variabilis* from the Levant (Perciformes: Pomacentridae)

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Abstract

In the present paper, we report the collection of a specimen of the West central Atlantic *Stegastes variabilis* in the shores of Israel, eastern shore of the Mediterranean. This record was preceded by a record of this species from Malta, in the central Mediterranean. The present record suggests that *S. variabilis* has established a small population in the Mediterranean.

Introduction

The Mediterranean is a semi-enclosed sea with only two narrow openings, namely, the straits of Gibraltar and the Suez Canal. The Mediterranean has become intensively invaded by non-indigenous fish species (Edelist *et al.*, 2013; Golani *et al.*, 2021). The phenomenon of fish invasions into the Mediterranean continues with no sign of cessation. Golani *et al.* (2021) updated the list of exotic fish species in the Mediterranean by presenting 188 species, of which 106 are from the Red Sea and Indo-Pacific origin and over 50 species from the Atlantic Ocean. The first record of an alien species in a new region is of scientific interest. However, reports of second and third records are also of great importance, since they enable documentation of the spread and establishment in the new region.

In the present paper we report the second record of the West central Atlantic species *Stegastes variabilis* from the Mediterranean coast of Israel, over 2000 km from the first Mediterranean record from Malta (Vella *et al.*, 2015).

Materials and methods

On 29 April 2022 a single specimen of *Stegastes variabilis*, 83.2 mm SL (104.6 mm TL) (Figure 1) was speared at a depth of 4 m near Caesarea at the Mediterranean coast of Israel (32°30'28"N 34°53'28"E). No other specimen was observed. The collected specimen did not have any observed special behaviour. The specimen was deposited in the National Fish Collection of the Hebrew University of Jerusalem and received the catalogue number HJ 21202.

Results

Short description

Body orbicular and compressed, its height 1.9 times in SL. Small head, 3.3 times in SL. Small, slightly oblique mouth. Maxilla reaching back to the vertical of anterior of eye. A single row of close-set teeth. Large eye, its diameter (3.9), wide interorbital (2.8), both times in head length. Preopercular strongly serrated. Lower limb of first gill arch with 9 rakers including the one in the middle and 5 rakers on the upper limb. Continuous dorsal fin with XII spines and 14 rays. Anal fin originated under the 10th dorsal ray, with II spines and 13 rays. Pectoral fin with 18 rays. Pelvic fin with one spine and 5 rays, the first filamented. Caudal fin slightly forked. Lateral line with 20 scales, terminating under the 9th dorsal ray.

Colour

Head and upper flank bluish-grey with many light blue dots. Lower part of the body yellow with 11 thin vertical dark lines. Dorsal fin bluish-grey, its posterior 5–6 rays yellow. Rest of fins yellow with a black margin of pelvic, anal and caudal fins. Black dot on the upper caudal peduncle. Eye dark with yellow ring.

Discussion

The family of Pomacentridae includes 428 species in four subfamilies and 29 genera (Nelson *et al.*, 2016; Fricke *et al.*, 2022). The genus *Stegastes* Jenyns, 1840 consists of 37 species in the subfamily Pomacentrinae, found in all tropical and subtropical regions. The genus *Stegastes* is characterized by serration on the posterior edge of the preoperculum, one row of teeth in the





Fig. 1. *Stegastes variabilis* (HUJ 21202), 83.2 mm (SL), 29 April 2022, speared at 4 m near Caesarea at the Mediterranean coast of Israel (photograph: D Golani).

jaws and usually two spines and 12–14 rays in the anal fin (Edwards, 2016). It was first described by Castelnau (1855) under the genus *Pomacentrus* Lacepède, 1802. Later it was placed in the genus *Eupomacentrus* Bleeker, 1877 which is a synonym of *Stegastes* Jenyns, 1840 (Emery & Allen, 1980). In the Mediterranean, there is a single indigenous damselfish species (*Chromis chromis*) and seven exotic species (Golani *et al.*, 2021), two of which, *Abudefduf saxatilis* and *A. vaigiensis*, are morphologically very similar, so that in the Mediterranean, there may be only a single species (Dragičević *et al.*, 2021).

The morphology, counts and colour pattern of the Israel specimen match perfectly that of *Stegastes variabilis* (see Randall, 1968, p. 192) under the genus *Eupomacentrus*. Originally *S. variabilis* inhabited the Gulf of Mexico and the Caribbean Sea. This species inhabits coral reefs to depths of 30 m. It feeds on sessile organisms, algae and small invertebrates. During the spawning season they live in pairs. The eggs are demersal and adhere to the substrate; the male guards the eggs until hatching. Larvae and postlarvae are planktonic.

Vella *et al.* (2015) reported the first record of *Stegastes variabilis* from the Mediterranean based on the DNA sequence of a specimen that was collected from Malta in September 2013 and had an atypical colouration pattern. Although Souza *et al.* (2011) showed the variability of colour pattern within *S. variabilis*, none of them was similar to the Maltese specimen. Vella *et al.* (2015) assumed that this species had reached the Mediterranean either by ballast or as an aquarium escapee. Specimens of this species were never imported to Israel (S. Khalil, Fishery Department, Ministry of Agriculture, pers. comm.). Therefore, the record from Israel suggests that the species has established a small population in the Mediterranean, similar to another western Atlantic coral reef associated species, *Acanthurus coeruleus*, Bloch and Schneider, 1801, that was recorded in several locations in the

eastern Mediterranean (Langeneck *et al.*, 2012; Golani *et al.*, 2015; Golani *et al.*, 2021).

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