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Presence Confirmation of Non-Native Species *Pagrus major* (Temminck And Schlegel, 1843) in the Eastern Mediterranean

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Abstract

Four specimens of red seabream *Pagrus major* (non-native species), were caught at the entrance of Amvrakikos Gulf and Echinades islands of the Ionian Sea (Western Greece). Identification was confirmed by genetics. Location and morphological characteristics as well as stomach content analysis and a brief history of farming attempts in the Mediterranean are presented.

Keywords: Non-Native Species; Pagrus Major; East Mediterranean

Introduction

Red seabream *Pagrus major* [1], mentioned *P. auratus major* by Tabata and Taniguchi [2] as subspecies of *P. auratus,* is distributed in the Northwest Pacific: northeastern part of South China Sea (Philippines excluded) northward to Japan [3]. The species is farmed in Japan for over 60 years [4]. Except for its native range, this species has not been reported as naturalized in any other marine area of the world. Although the red sea bream *Pagrus major* successfully bred since 1985 sporadically or continuously in fish farms in Mediterranean, namely Croatia, Italy, Cyprus and Greece [5-8], there is only one reference concerning the catch of one individual in the field (2004, Island Molat - eastern middle Adriatic) [1]. The lack of additional relevant information on this subject is probably due to the difficulty of the macroscopic distinction of this species from the native species *Pagrus pagrus*. The color differences of the body, head and fins mentioned in the relevant identification keys [9,10] are not easily identified by fishers and consumers.

Matherial and Methods

Four specimens of red sea bream *Pagrus major* were caught in the Ionian Sea from September 3 to November 1, 2018. The identification of these specimens as *Pagrus major* was initially based on the particular coloring of the caudal fins, black posterior margin, lower margin white [10] and it was confirmed by genetic analysis. Total genomic DNA was extracted from fin tissues using modified salting out procedure [11]. The DNA barcoding of the analyzed samples (sample codes 141, 144, 353 and 354) was based on the PCR amplification of the mtCOI gene marker using the universal primers FishF2/FishR2 [12]. The PCR products were purified by a PEG (Polyethylene glycol)-NaCl method [13]. Both strands were sequenced using the Big Dye Terminator v3.1 Cycle Sequencing Kit (PE Applied Biosystems) in a 3500 Genetic Analyzer (Applied Biosystems) and all retrieved sequences were manually edited with Geneious 7.1.2. Total length, weight, sex and stomach contents of the specimens were recorded.

Results

Fishing data and the main features of the caught fishes are given in Table 1. Three of them were caught at the entrance of Amvrakikos Gulf and one, coded as 144, in Echinades islands (Ionian Sea). Eleven items were found in the stomach of this specimen, the composition of preys per animal group being 8% Brachyura (crab claws), 8% Echinoidea, 42% Chaetognatha, 25% Bivalve, and one piece of sardine (8%), possibly the long line bait (Table1). None of the captured specimens showed skeletal malformations, as confirmed also by X-Rays images.

Table 1: Catch data and main characteristics of Pagrus major specimens caught in the Ionian Sea.

Fish code number	141	144	353	354
Fishing area	Amvrakikos Gulf	Echinades islands	Amvrakikos Gulf	Amvrakikos Gulf
Date of catching	30/9/2018	7/10/2018	30/10/2018	1/11/2018
Site coordinates	38.934N 20.737E	38.43 - 38.49N 21.01 - 21.07E	38.928N 20.743E	38.943N 20.741E
Site deepth (m)	6	?	3	4
Fishing gear	Gill net	Long-line	Gill net	Gill net
Total length TL (cm), Weight (g), Sex	25.2, 231, ♂	35.4, 681, ♀	24.4, 209, ♀	24.3, 225, ♂
Stomach contents	NO	YES	NO	NO

Regarding the verification of the species, based on the BLAST analysis of the datasets of the mtCOI gene, it seems that all analyzed samples were identical and more like the *Pagrus major,* thus the mtCOI sequences were identical with five P. major specimens (KU199070, KU199066, GU207340, FJ237862 and AP002949, with coverage 650 bp/650 bp all of them). The history of the species in the area, the short sampling period of the study and its limited spatial range, suggest that a larger and more specific field study is necessary to evaluate the imprint of this non-native species in the Eastern Mediterranean.

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