

LESSEPSIAN FISH MIGRANTS IN THE HELLENIC SEAS: SPATIAL VARIATION OF THEIR OCCURRENCE IN BOAT-SEINE CATCHES

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Abstract

Seven Lessepsian fish species, *Etrumeusteres*, *Fistulariacommersoni*, *Lagocephalus sceleratus*, *Pteragogus pelycus*, *Siganus luridus*, *Siganus rivulatus* and *Stefanolepis diaspros*, have been identified in boat-seine catches at depths 11-54 m in the Hellenic Seas from October 2008 to March 2009. The frequency of Lessepsian fish's occurrence in boat-seine hauls tended to decrease from southeastern to northern and western Aegean Sea, while it was generally increasing proportionally to the number of years since each species entry in the Hellenic waters.

Keywords: Aegean Sea, Ionian Sea, Fishes, Lessepsian migration, Coastal Waters

Introduction

Fish species of Indo-Pacific Ocean origin have been reported from the Hellenic Seas since the early 1930's, their findings and expansion being accelerating in recent years [1]. The majority of the 29 up to date Lessepsian fish migrants [2, 3], are neritic species caught down to 68 m [1], usually by artisanal fishing gears. The extensive study of the boat-seine gear and its effects to fish stocks, carried out during the fishing period October 2008 - March 2009, in the framework of the Operational Program of Fisheries 2000-2006 of the Hellenic Ministry of Rural Development and Food, constituted an ideal opportunity to study the frequency of occurrence of Lessepsian fishes in the catches of this selective fishing gear operating in the Hellenic coastal zone.

Materials and Methods

For the analysis of the boat-seine catches, the studied hauls were grouped in the following fishing regions : NE. Ionian, SE Ionian, Corithiakos Gulf, NE Aegean, South Evoikos Gulf, Saronikos Gulf, Argolikos Gulf, Cyclades Islands, Lakonikos Gulf and SE Aegean. The frequency of occurrence of each Lessepsian fish species was calculated as the percentage of the hauls in which it has appeared in relation to the total number of hauls examined by fishing region during the whole study period.

Results and Discussion

Seven Lessepsian fish species have been identified from boat-seine catches. At least one Lessepsian species was present in 115 hauls of the 239 hauls examined and at 8 of the fishing regions studied (Table I).

of hauls. The present study resulted in substantial northward extension of the previously known expansion for *S. diaspros* and *P. pelycus* [3] that is probably favoured by the rise of sea temperature in the Aegean Sea [4]. The new findings of most Lessepsian species, except *L. sceleratus*, widening their spread in the southern Aegean Sea according to previous records in the data base of the Ellenic Network on Aquatic Invasive Species (ELNAIS), should be rather attributed to the lack of previous systematic study of coastal fisheries catches composition. The exceptional multiple records of *L. sceleratus* during the last 3 years is due mainly to the particular interest that was expressed by the social and scientific institutions because of its potential risk for human consumption.

References

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Tab. 1. Frequency of occurrence (%) of Lessepsian fish species in the boat-seine hauls carried out during the fishing period October 2008-March 2009 in the Hellenic coastal zone, by geographic region. The year of species first finding in the Aegean Sea is noted in parenthesis

Fishing Region	<i>L. sceleratus</i> (2005)	<i>F. commersoni</i> (2001)	<i>P. pelycus</i> (1992)	<i>E. teres</i> (1999)	<i>S. luridus</i> (1964)	<i>S. rivulatus</i> (1932)	<i>S. diaspros</i> (1943)
NE. Ionian					18.2	4.6	
NE Aegean		2.8					5.6
S. Evoikos Gulf	17.4						60.9
Saronikos Gulf			14.3		14.3	19.1	52.4
Argolikos Gulf	10.7	10.7	10.7		14.3	3.6	39.3
Cyclades Isl.	9.1	18.2	2.3		40.9		50.0
Lakonikos Gulf		11.8	35.3		29.4	11.8	35.3
SE Aegean		100.0	100.0	33.3	100.0	100.0	

The percentage of hauls, where Lessepsian migrants appeared, was considerably higher (>60%) in the southernmost fishing regions of the Aegean Sea, reaching the 100% of hauls realized around Kos island (SE Aegean). This pattern is obviously related with the pathways generally followed by Indo-Pacific species when enter in the Mediterranean Sea through the Suez Canal, first spreading northward along the Asiatic coasts favored by Asia Minor Current and then westwards involved, as adults or more likely as pelagic early juveniles, in the cyclonic and anticyclonic eddies prevailing at south of Rhodes and Crete islands, as well as in the southern Aegean Sea. As it concerns the frequency of occurrence of individual species, it seems to be increased in proportion to the number of years that have passed since the species' first finding in the Hellenic waters (Table I), with the exception of *S. rivulatus* that even if it is the older installed species presents relatively low frequency of appearance, probably due to competition with the sympatric *S. luridus*. *S. diaspros* was the most often recorded species (at 28% of hauls), followed by *S. luridus* (at 17% of hauls) while the remainder were found in less than 10%