

# IMPACT OF INVASIVE SPECIES ON THE BIODIVERSITY AND FISH STOCK; CASE STUDY: *FISTULARIA COMMERSONII* RUPPEL, IN THE SYRIAN COAST

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## Abstract

Reproductive cycle and feeding habit of bluespotted cornet fish *Fistularia Commersonii*, new lessepsian migrant was studied in the Syrian coastal water (Levantine Basin). *Fistularia commersonii* recorded for the first time in this area during 2001 has shown a rapid development among the ichthyofauna in the Eastern Mediterranean. It is carnivorous, and feed on many small fish species, such as *Sardinella* spp., *Sprarus spratus*, *Alosa fallax*, *Boops bops* etc. 12-30 individual preys was found in the stomach of every specimen. The high fecundity rate, the long period of reproduction, (May–August) and its rapidly expanding population feeding on fish, make a decline of the biomass and causing damage and loss to fisheries yield.

**Keywords:** Life Cycles, Migration, Biodiversity, Fishes, Levantine Basin

## Introduction

During the nineties, a strange fish species of Indo-Pacific origin from family Fistularidae (cornetfishes) appears in the south-east Levantine Basin, the first record was reported by in the Palestinian coastal [1]. In July 2001 three specimens of *Fistularia commersonii* of total length (ST): 35.6; 77.8; 82.3 cm (SL) respectively was caught with beach seine in the seawater south Lattakia (35.44° N; 35.89° E) at a depth of 12 m. It was the first record of this lessepsian specis in the Syrian waters [2]. It was also reported in adjacent Lebanese coastal waters [3]. Two years later, it was observed with great number and became strong invader with regard to the increased percentage in the catch. Given the environmental conditions changes occurring in the Mediterranean and because of the connection between the Levantine Basin and the Red Sea through the Suez Canal, the East Mediterranean was subject to a big invasion of marine species. In the beginning this invasion was very slow because of the big difference in salinity between the both marine environments and because the high salinity of Bitter lake which constituted a natural barrier to the migration of marine organisms. Prior the construction of Aswan High Dam, the freshwater of the Nile during the flood, in reducing the salinity at the entrance Nord of the canal at Port Sa&iuml;d, contribute to constitute a hyposaline seawater forming a barrier to this migration. After the functioning of the High Dam in 1965 and the stop of the flood, the salinity of the south-east corner of Mediterranean start increasing , making little difference in the salinity between the Red sea and East Mediterranean. The increased navigation through the Canal pathway during the last century and the global warming occurring word wide in the oceans inducing the rise of the Mediterranean water salinity have enhanced the Lessepsian migration process. The number of invasive fish species in the Levantine Basin reach to date 65 [4,5] , from which 43 are recorded in the Syrian waters. [6 ] *Fistularia commersonii* is themore recent newcomer fish record in our water [2], measuring a total length of 29 cm. Afterwards the caught number by fish training nets increased progressively. In May 2003, 36 individuals measuring between 40 and 108 cm were caught in only one fish net. After this period, we observed increasing frequency of this invading species in the fishermen nets and with high number forming about 2-3% of the total net coastal catch. Given that the introduction of new species in the environment can surely affect in the marine biodiversity and in the competition of the biocoenoses and food, it is very important to know the behavior of reproduction and feeding of the newcomers in the local ecosystem in order to know it stock management and understand the relationship between themselves and between them and native species and thus knowing its role in the structure of the biodiversity in this ecosystem.

## Material and methods

The study was performed in the coastal area of Lattakia along 80 km between Turkish border in the north and Baniyas in the south. A total of 460 specimens of Bluespotted cornet fish *Fistularia commersonii* were collected by beach seine and trammel net at depth of 2-20 m from August 2004 to September 2005. For each fish, the total length (TL) and standard length (SL) were measured to the nearest centimeter and total weight (W) to the 0.1 g. Sex and maturity were determined macroscopically. The weight of the gonad (Wg) was recorded to the 0.01 g. Spawning season was determined in using the monthly change of stages of maturation and the gonado-somatic index (GSI). Fecundity was estimated gravimetrically. In addition, the feeding habit was studied by analysis of food content in the digestive tube.

## Result and Discussion

The GSI values of females were generally higher than those of males, but both

indices followed the same pattern. According to the examination of maturation stages and GSI values, *Fistularia commersonii* spawned in the Syrian coast from the second half of May until early August, with greatest intensity in June (Fig.1). The first sexual maturity of *F. commersonii* shows that 50% of females and males are sexually mature at standard length of 57.5 and 56 cm respectively . Males matured at smaller length intervals than females. Fecundity ranged between 355-697 eggs/g /ovary. This high fecundity rate contributes to increase the recruitment and juvenile population invade new ecological niches at the expense of native fish species. Certain negative impact on local fish stock through predation and feeding on small fishes was noticed (Fig.2). In studying the reproductive regime and the dynamics of the reproduction, we conclude that *Fistularia* is a carnivorous predator feeding quasi exclusively on local fish, namely *Sardinella aurita*, *Boops boops* and *Engraulis encrasicolus*. The stomach content analysis has shown 20-25 fish individuals in one digestive. This may give an idea of the strong negative effect of thousands of *Fistularia* individuals on local living fish stock.

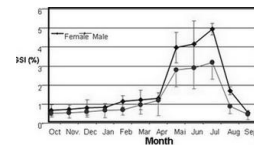


Fig. 1. Evolution of gonado-somatic index (GSI) of *F. Commersonii*

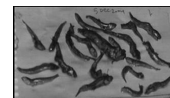


Fig. 2. Composition of fish preys in the stomach content of *F. Commersonii*

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