

SIGANUS SPECIES IN AN ARTISANAL FISHERY IN THE EASTERN AEGEAN

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Abstract

Underwater visual census (UVC) surveys, fishery landings surveys and interviews were used to assess the level of *Siganus* spp. invasion in Fourni island complex, NE Aegean Sea, Greece. Results showed that despite a high abundance of *Siganus* spp. being observed in UVC surveys, this was not translated into fisheries landings. Interview surveys identified avoidance behaviour and discarding activities by local fishermen, due to the low economic value of *Siganus* spp. fish in the specific region. This study provides evidence that changing public perceptions could bring both economic and ecological benefits to the local area.

Keywords: *Lessepsian migration, Aegean Sea, Fisheries*

Introduction

Siganus spp. are considered to be amongst the 100 worst invasive species in the Mediterranean [1], and have been shown to cause a significant impact on local ecosystems [2]. They have become established in a relatively unsaturated niche, due to a scarce number of indigenous herbivorous fish and now pose serious competition for food and habitat, to native herbivores, which are economically important species [4]. This study comments on the extent of the *Siganus* invasion, the fishermen's perceptions, and the implications for the fishery in the region of Fourni island complex, NE Aegean Sea, Greece.

Methods

Three parallel studies were conducted to obtain the relevant information:

1. Fish populations were surveyed between 31st August and 26th September 2012 over *Posidonia oceanica* meadows and rocky algal habitats using standard underwater visual census (UVC) as described by Sala *et al* [2].
2. Daily port landing surveys of the artisanal fishing fleet were conducted at the main port on Fourni, recording species and total length (cm) throughout 2012.
3. Interview based surveys of local fishermen were conducted in order to gauge perceptions of the *Siganus* spp. catch.

Results

The composition of herbivorous fish recorded in UVC surveys differed to that of the fishery landings surveys. In the UVC data, *S. luridus* accounted for 67% of all herbivorous fish observed, but it only accounted for 15% of herbivorous fish landed. In contrast, in the UVC data *Sparisoma cretense* only accounted for 24% of the herbivorous fish observed, but accounted for 83% of all herbivorous fish landed. *S. luridus* has clearly replaced the native *S. salpa* in Fourni, as evident in both the UVC and fisheries surveys (fig 1). *S. luridus* can now be considered established on Fourni, this is verified by the presence of both juveniles and adults at all sites (mean of 31 individuals at each site) and by the dominance in terms of biomass of *S. luridus* at three out of four sites surveyed.

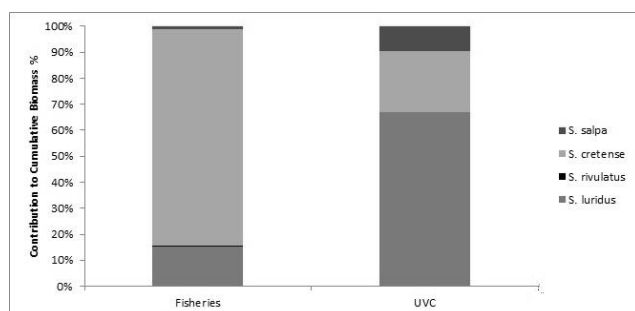


Fig. 1. The composition of herbivorous fish in UVC and fisheries surveys

The results indicate that *Siganus luridus* is the most abundant herbivorous fish species in shallow water ecosystems in Fourni, however they have not replaced *S. cretense* as the dominant herbivorous species in fishery landings. One possible explanation may be due to discarding of *Siganus* at sea, which was

evident from interviews and on-board observations, due to its low commercial value in this region. Another possibility identified by the results from our surveys was that local fishermen actively avoided areas which were likely to yield high catches of *Siganus*, due to the increased labour involved in removing fish of poor value from their nets. In some areas in the Mediterranean, *S. luridus* has been successfully introduced into the market, which has shown a positive effect on the fishery [5]. In Fourni there is currently no market for the species, and fishermen doubt it would ever be profitable. However, it is worth noting that perceptions of the Fourni community have changed previously, for example, *Mullus surmulletus*, a fish now of high economic importance, was also once unpopular. Considering the abundance of *Siganus*, if consumer neophobia could be overcome, and a market established for *Siganus* in Fourni, it would have the potential to bring economic benefits to the fishery as well as ecological benefits to the ecosystem [2].

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