

FISH ASSEMBLAGE OF THE MAR PICCOLO BASIN OF TARANTO (SOUTHERN ITALY): COMPOSITION AND STRUCTURE

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Abstract

The fish assemblage of the Mar Piccolo estuary was studied from September 2007 to August 2008. Using a 50m beach seine a total of 6796 fishes, mainly juveniles, belonging to 16 families and 28 species were caught at 10 stations. The highest number of species was caught during spring-summer months while the number of specimens was highest in summer and autumn months. The most abundant species were *Atherina boyeri* (32.1% of total individuals) and *Liza aurata* (28.3%). Statistically significant variations among sampling time were detected for fish abundance, number of species, Shannon's diversity, Evenness, Margalef's Richness and Simpson indices, (ANOVA; $p < 0.001$).

Keywords: *Fishes, Ionian Sea, Lagoons, Biodiversity*

Introduction

European Council Directive [1], indicated the fish communities as key biological component in the assessment of the ecological status of transitional water [2, 3]. Among the estuarine areas in the Mediterranean sea, the Mar Piccolo estuary is located on the Ionian coast of Taranto (Apulia region, Italy). The present work aimed at providing an updated list of species taking into account also the structural approach. The specific objectives of this study were: 1) relationship between the principal abiotic factors with fish assemblages; 2) description of the fish communities from a taxonomic and structural point of view. Material and Methods Sampling was performed every month from September 2007 to August 2008 during daylight hours, in ten stations: three of which were situated in the 1st Inlet, and seven in the 2nd Inlet. At each sampling station three replicates were collected. The mean temperature (°C) and salinity were measured for each sampling time considering the stations pooled values as replicates. Fish samples were collected using a 50m beach seine with a height of 5m and mesh of 2mm. The mean fish abundance (number of individual), number of species and standing stock (grams of fish biomass) were calculated. Basic community index: Shannon-Wiener's diversity, Pielou's index (J), Margalef's richness index (d) and Simpson index were recorded. Two-way analysis of variance (ANOVA) was used to assess temporal differences in total fish community.

Results and Discussion

The water temperature followed a seasonal trend, with a minimum value in December ($10.5 \pm 0.5^\circ\text{C}$) and maximum in August ($25.5 \pm 1^\circ\text{C}$). Salinity was lowest in January ($35 \pm 1\text{‰}$) and highest in October ($36.8 \pm 0.5\text{‰}$). Salinity was directly related to temperature ($p < 0.001$; $r = 0.71$). Multiple regressions indicated that the number of individuals and standing stock, showed no significant relationship with environmental variables ($p > 0.05$). A total of 6796 fishes belonging to 16 families and 28 species were caught. The highest number of species was caught during spring-summer months, while the number of specimens was highest in summer and autumn months. The highest number of species recorded in spring shows that this ecosystem is an important spawning and nursery area. This ecosystem supported a number of species within of the European estuaries range, 14 (Essex Coastline, UK) and 110 (Thames) species with an average (\pm SD) of 53 ± 20 in 38 European estuaries [4]. The most abundant species were *Atherina boyeri* (32.1% of total individuals) *Liza aurata* (28.3%), *Symphodus cinereus* (7.2%), *Zosterisessor ophiocephalus* (7.1%), *Liza saliens* (5.5%), *Engraulis encrasicolus* (2.7%), *Symphodus tinca* (2.6%) and *Sparus auratus* (2.5%). Fish abundance, number of species, Shannon's diversity, Evenness, Margalef's Richness and Simpson indices, revealed a highly significant variation among sampling time (ANOVA; $p < 0.001$). Mar Piccolo ichthyofauna includes marine euryhaline species that permanently live in the estuary, such as *A. boyeri*, *Aphanius fasciatus*, *Z. ophiocephalus*, *Gobius niger*, *G. paganellus* and *Syngnathus acus*. The ichthyofauna also includes juveniles of euryhaline marine species for which this highly productive habitat provides a nursery ground (*Sparus aurata*, *Dicentrarchus labrax*, *Diplodus vulgaris*, *Sarpa salpa*, *Mullus barbatus*, *Symphodus rostratus*, *S. tinca*, *S. cinereus*, and almost all species of Mugilidae). The results obtained from this study provide a first contribute to knowledge of temporal patterns of structural fish assemblage in Mar Piccolo basin. However, due to anthropogenic pressures such as industry, fisheries and other maritime activities, it is necessary to protect and monitor this important fish habitat.

References

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