

MARINE BIODIVERSITY AND FISHERY RESOURCES IN SYRO-LEBANESE COASTAL WATERS (LEVANTINE BASIN)

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Abstract

A study on fish food and feeding regime was carried out during 2004–2008 in adjacent Syrian and Lebanese coastal water. Stomach and intestine content analysis was conducted on one selected fish herbivorous, carnivorous and omnivorous in order to study the nature and composition of the food as related to fish resources. Herbivorous rabbit fish (*Siganus rivulatus*) feed on available chlorophytes, phaeophytes and rhodophytes algae, whereas demersal carnivorous grouper (*Epinephelus marginatus*) feed on small fishes, cephalopods and crustaceans. Pelagic sardine (*Sardinella aurita*) and anchovy (*Engraulis encrasicolus*) are mostly planktonivorous. Benthic *Solea vulgaris* is a carnivorous regime feeding on benthic invertebrates including meiofauna.

Keywords: Biodiversity, Fish Behaviour, Fishes, Levantine Basin

Introduction

Adjacent Lebanese and Syrian seawaters show similar oceanographic characteristics and both of regions present oligotrophic water body inducing low primary productivity and thus poor fish production. In spite of high marine biodiversity and good fish resources, fishing landing remain in deficit. Data on the major flora and fauna are available [1], but the information remain incomplete with regard to the relation between fish resources and marine biodiversity. Based on the knowledge and data available with regard to the composition and abundance of marine flora and fauna of the local coastal, the study of fish food and feeding regime would be easier and reachable. In previous study we attempt to study the diet of some fish species [2]. In this paper an attempt is made to study the diet and feeding regime of some species representing herbivorous, carnivorous and planktonivorous fish and correlated between fishery resources, feeding regime and marine biodiversity.

Methods and Material

Stomach and intestine content analysis was performed on freshly caught fish specimens from different regions of Syrian and Lebanese coastal waters. Hydrological parameters including temperature, salinity, nutrient and chlorophyll.a were taken at the same fishing areas. Information regarding the biodiversity of pelagic, benthic and littoral flora and fauna in the same sampling zone, are available from previous works [3,4,5,6] The selected species subject to food and feeding regime study are: carnivorous *Epinephelus marginatus*, planktonivore *Sardinella aurita*, herbivorous *Siganus rivulatus* and benthic *Solea vulgaris*.

Results and Discussion

The adjacent Lebanese and Syrian coastal waters show similar oceanographic characteristics and mostly the same habitats. Furthermore, certain homogeneity in the biodiversity of flora and fauna is observed and thus a resemblance in fishery resources between the two marine regions. Marine flora and fauna of the Syro-Lebanese coastal waters are highly diversified; most of the Mediterranean groups are found in the area. In addition to those, several species of Indo-Pacific origin, including fishes, were introduced or have migrated from the Red Sea into the Levantine Basin, where many invaders have established permanent populations. The composition of the food in the intestine of *Epinephelus marginatus* is formed with pieces of small fishes of *Scorpaena*, *Epinephelus*, *Trigla*, *Serranus*, *Mullus*, *Diplodus*, *Sparus*, *Pagellus*, *Coris julis*, *Gobius*, *Blennius*, *Solea*, *Venus*, *Conus*, *Cardium*, *Sepia officinalis*, *Octopus vulgaris*, *Penaeus*, *Scyllarus*, *Palaemonidae*, *Asterina*, *Asterina*, *Polychaetes* etc. Herbivorous rabbit fish *Siganus rivulatus* which is an invading tropical species in the area; it is very abundant in the near coastal water. It feeds all the time without discontinuity, even during the reproduction and spawning periods in spring. The composition of the food in the stomach and intestine of the rabbit fish is formed with pieces of macroalgae from Rhodophytes (*Porphyra*, *Corallina*, *Galaxaura*, *Amphiroa rigida*, *Ceramium*, *Hypnea*, *Jania rubens*), Chlorophytes from genera *Ulva*, *Enteromorpha*, *Cladophora*, *Codium*, *Phaeophytes* (*Padina pavonica*, *Sargassum vulgare*, *Dictyopteris*, etc.). Planktonivore fish *Sardinella aurita* feed mostly on phytoplankton and zooplankton. This pelagic fish is present in our waters only during the spawning periods between May and July. The digestive tube content reveals the presence of debris of diatoms from *Chaetoceros*, *Coscinodiscus*, *Bacteriastrum*, *Rhizosolenia*, and dinoflagellates such as: *Ceratium*, *Dinophysis*, *Protoperidinium*, *Ornithocercus*, and pieces of microzooplankton (*Codonella*, *Codonella*, *Eutimninus*, *Globigerina*). From

macrozooplankton we distinguish in the digestive tube *Sagitta*, *Copepods*, *Cladocera*, *Polychaeta*, *Pteropods*, *Fish larvae*, etc. Benthic flat fish *Solea vulgaris* live on the sandy seafloor; it swim with difficulty and move very slowly above the bottom. The fishing yield of this species is poor may be because of the lack of appropriate fishing gear and the limited fishing ground. The stomach content reveals the presence of benthic invertebrates such as: mollusks, crustaceans, varied meiofauna; we also distinguish benthic algae namely *Caulerpa*, and phanerogams *Zostera* and *Cymodocea*. Fishing activity tends to reduce natural fish stock; in which a big amount is caught according to its abundance and the fishing effort. Other factors might also affect the fish stock such as anthropogenic activity and overfishing which contribute to reducing fisheries and fishing yield. Some species constitute target to fishermen, particularly during reproduction and sexual maturity and before spawning; this can lead, to the deterioration and collapse of the stock.

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