

Josep Lloret

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(Present address: CMIMA-CSIC, Barcelona, Spain) - lloret@icm.csic.es**Abstract**

The lipid content in the muscle of two exploited fish off NW Mediterranean was studied in relation to habitat. Results showed that the lipid content of *Pagellus acarne* was higher in the northern than in the southern parts of the study area. Furthermore, there was a significant ($P < 0.05$) effect of depth on lipid content, with fish characterized by the highest lipid levels inhabiting the shallowest parts. The results also revealed differences in the condition of *Diplodus sargus* between protected and unprotected habitats, with condition being highest within the protected ones.

Keywords: Fish condition, Ecophysiology, Habitat, Marine Protected Areas

Introduction

Despite evidence on the importance of fish condition and the function of habitat for marine fish production, condition has seldom been used to assess habitat quality in marine ecosystems, where most research on essential fish habitats deals with differences in abundance and biomass between habitats (1). The condition of a fish is affected by interactions among habitat characteristics and the physiology of the fish and can have major consequences for the health of individual fish and influence survival and population success (2). This study aims to study the habitat effects on fish condition in the NW Mediterranean.

Materials and Methods

Individuals of *Pagellus acarne* were obtained at different depths from two areas of the continental shelf in the NW Mediterranean: the southern Gulf of Lions and the southern Catalan Sea. Samples were derived from EU "MEDITS" groundfish surveys, experimental trawls and from commercial trawl and gill-netters, between June and August 2001.

At a small scale, individuals of *Diplodus sargus* were collected from the rocky protected bottoms of the Natural Park of Cape Creus, and from the adjacent rocky unprotected bottoms, by spear fishing at night at several sites, from 0 to 10 m depth. Determination of total lipid (% dry weight) was carried out in the laboratory from muscle samples. Total lipids were determined spectrophotometrically with the sulphophosphovanillin method (3).

Results

Individuals of *P. acarne* from the Gulf of Lions showed a significant (ANOVA, $p < 0.05$) higher percentage of lipid in the muscle (mean=2.38, SE=0.20, n=230) compared to individuals from the Catalan Sea (mean=0.94, SE=0.49, n=38). There is a significant (linear regression, $p < 0.05$) effect of depth on the lipid content: the lipid content in the muscle decreased with depth (Fig. 1). Significantly (ANOVA, $p < 0.05$) higher lipid levels in muscle of *D. sargus* spawners were detected in the rocky protected areas of Cape Creus (mean=0.75, SE=0.06, n=32) compared to the rocky unprotected areas (mean=0.49, SE=0.06, n=43).

Discussion

The results showed that there are significant spatial and bathymetric differences in the condition of fish species inhabiting the NW

Mediterranean. The Gulf of Lions/northern Catalan Sea might provide good food supply for some species as a result of river runoff and wind mixing. The negative relationship between condition and depth suggests that the deeper areas of distribution of a given species represent a marginal habitat in terms of food resources. Results from the present study also indicate a possible reserve effect on the condition of *D. sargus*.

References

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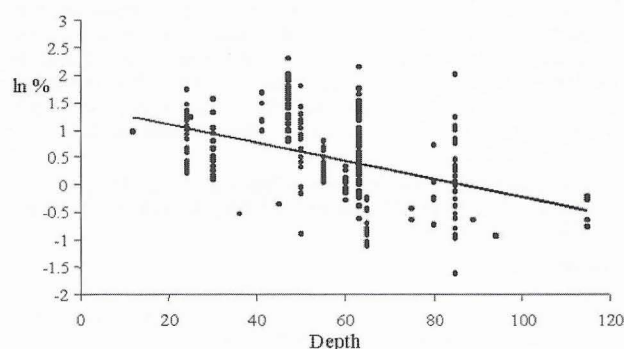


Fig. 1. Relationship between muscle lipid content (ln % lipid dry weight) and depth for individuals of *Pagellus acarne*.