

TROPHIC RELATIONSHIP BETWEEN *LOLIGO VULGARIS* AND *POSIDONIA OCEANICA* IN CATALAN WATERS (NW MEDITERRANEAN)

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Abstract

The possible trophic relationship between *Posidonia oceanica* and the abundance of *Loligo vulgaris* in the Catalan coast (NW Mediterranean) was investigated. The results suggest that food source of *Loligo vulgaris* is closer to *Posidonia oceanica* than to phytoplankton.

Keywords: Behaviour, Cephalopods, Western Mediterranean

Introduction

L. vulgaris distribution extends along the eastern Atlantic, from the North Sea and British Islands (55° N) to the south-western coast of Africa (20° S), and also throughout the Mediterranean Sea (1). *L. vulgaris* distribution in the Mediterranean Sea, mainly concentrates in areas shallower than 100 m. It generally inhabits temperate waters. In the Mediterranean, *L. vulgaris* is mainly a by-catch of the multispecies bottom trawl fisheries, throughout the year. Near the coasts where it concentrates during autumn and winter for spawning, small-scale professional and sport fishermen usually target it using hand-jigs. Juveniles recruit to the fishery at approximately three-four months age (2). The purpose of this work is to study the possible trophic relationship between *Posidonia oceanica* and the abundance of *L. vulgaris* in the Catalan coast (NW Mediterranean).

Material and Methods

Sampling was carried out on board commercial trawlers on a monthly basis, from October 2003 to December 2005 in Roses, Blanes and Cambrils Catalonia ports (NW Mediterranean). The landings and landings-per-unit-effort, LPUE data were obtained from the DGPAM (General Direction of Fishing and Maritime Affairs) of the Catalan Government for the period 2000-2005. Data of stable carbon isotope are from the project "Avaluació de l'estat de les poblacions de *Loligo vulgaris* a Catalunya" financed by Autonomous Government of Catalonia. Isotopic value of *Posidonia oceanica* is -14.3 (s.d.=0.153) and for phytoplankton -23.6 (s.d.=0.71).

Results and Discussion

LPUE data series showed a clear pattern of abundance from North (Llança) to South (Sant Carles) (Fig.1) being more abundant in the North and Central areas than on the South. It is well known that temperature is an important factor in the recruitment of the species (3) but not the unique. The distribution of *Posidonia oceanica* in Catalan waters is shown in figure 2. *Posidonia* meadows are more abundant in North and Central area of study. Our objective was to use stable carbon (C) isotope ratio of the mantle of *Loligo vulgaris* to typify the trophic state of the species and its relationship with *Posidonia oceanica*. Food sources were investigated using a mixing model based on phytoplankton and *Posidonia oceanica* source isotopic composition data previously obtained. Isotopic values of mantle of *Loligo vulgaris* varied between -17.3 (s.d.=0.2) in Cambrils, 17.4 (s.d.=0.1) in Blanes and -18.5 (s.d.=0.2) in Roses. Our results suggest that source of food of *Loligo vulgaris* is closer to *Posidonia oceanica* than to phytoplankton. This doesn't mean that *Loligo* eats directly on *Posidonia* but belongs to a trophic net where *Posidonia* is an important source of carbon.

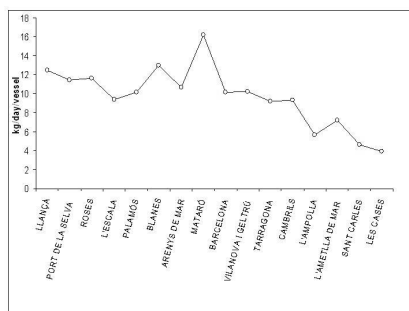


Fig. 1. Mean CPUE (2000-2008) of *Loligo vulgaris* on 16 ports of Catalan coast. From North (Llança) to South (Sant Carles)



Fig. 2. Qualitative presence of *Posidonia oceanica* on Catalan coast. Redrawn from www.cram.org

References

- 1 - Guerra A., 1992. Mollusca, Cephalopoda. In: Fauna Ibérica. Museo Nacional de Ciencias Naturales. SIC. Madrid. 327 pp.
- 2 - Guerra A., Sanchez P. and Rocha, F., 1994. The Spanish fishery for *Loligo*: Recent trends. *Fish. Res.*, 21 (1-2): 217-230.
- 3 - Sanchez P., Demestre M., Recasens L., Maynou F. and Martin P., 2008. Combining GIS and GAMs to identify potential habitats of squid *Loligo vulgaris* in the Northwestern Mediterranean. *Hydrobiologia*, 612:91-98.