

BIOLOGY (GROWTH AND REPRODUCTION) OF THE MEDITERRANEAN DEEP WATER ROSE SHRIMP (*PARAPENAEUS LONGIROSTRIS* (LUCAS, 1846) CRUSTACEA, DECAPODA) FROM THE ALICANTE GULF (S.E. SPAIN)

M. Garcia Rodriguez¹*, J. Perez Gil², E. Barcala², N. Carrasco², A. Esteban²

¹ Instituto Español de Oceanografía. Servicios Centrales. Corazon de Maria 8. 28002-Madrid (Spain) - mariano.garcia@md.ieo.es

² Instituto Español de Oceanografía. Centro Oceanográfico de Murcia. San Pedro del Pinatar. Murcia (Spain)

Abstract

The deep-water rose shrimp (*Parapenaeus longirostris*) is a demersal species and an important resource for the trawl fishery in the Alicante Gulf (S.E. Spain). This paper describes, for first time in this area, certain biometric relationships, as well as growth parameters and reproductive patterns of the species. The results showed a sexual size dimorphism, with a negative allometry of relative growth and high rates of absolute growth, both particularly in males. However, females dominated in the catch proportion. The spawning period occurred throughout the year, but especially in June-July and in October-November and the maturation stage for females takes place within the second year of life.

Keywords : *Decapoda, Growth, Reproduction, Western Mediterranean.*

Introduction

The deep-water rose shrimp (*Parapenaeus longirostris*) is a demersal species that is found on sandy and muddy bottoms in the Mediterranean Sea and the south Atlantic coast of the Iberian peninsula, being more abundant at depths of between 150 m to 400 m. It is considered a by-catch species of the trawl fishery, except in years of high abundance when it becomes a target species. Landings at the studied port can represent 65 tons per year in average, meanwhile for the whole GSA6 area can reach 332 tons per year. It shows a high inter-annual variations. Despite the fact that it has been studied in others Mediterranean areas [1][2], we describe for the first time some biological parameters of the species from an area defined between Cape Palos and Cape San Antonio (Alicante Gulf).

Materials and Methods

A total of 60 samples were obtained, by means of monthly random stratified samplings from January 2001 to December 2005 in the Santa Pola port, on the landings come from commercial fleet that operates at the Alicante Gulf. A total of 17,428 specimens were sexed and their cephalothoracic length (CL) measured. In addition, 36 samples were obtained by monthly sampling carried out during the 2003-2005 period, providing 9,785 additional individuals that were analysed in detail. The parameters of the size-weight relationship were determined by regression. The estimates of the Von Bertalanffy growth parameters were obtained from monthly length frequency distributions by sex for the 2001-2005 period. Sexual ratios were calculated by size class. Maturity for females was determined by macroscopic observation, following a scale of three maturity stages: (1) Immature; (2) Developing; (3) Mature. Finally, the percentages of maturity by size for each sex were calculated, in order to determine the size at 50% first maturity, adjusting a logistic model. All calculations were made using the INBIO statistical package in R language.

Results and Discussion

The sizes of the females varied from 10.0 mm to 42.0 mm CL, with a mean size of 27.7mm CL. The males varied from 14.0 mm to 33.0 mm CL, with an average of 23.2 mm CL. Males represented 45% of the landings in number, whereas the remaining 55% corresponded to females. The mean size of the landings was 25.7 mm of CL. The contribution of the individuals to the yearly total landings by sex showed a size dimorphism for the species, with males being smaller than females (Fig.1). The results obtained for the different size-weight relationships by sexes ($W = a * CL^b$) (males: $a = 0.0029$; $b = 2.483$; $R^2 = 0.91$; $n = 4,258$. females: $a = 0.0024$; $b = 2.567$; $R^2 = 0.96$; $n = 5,527$. $m + f$: $a = 0.0020$; $b = 2.61$; $R^2 = 0.96$; $n = 9,785$) showed a negative allometry, more noticeable in males. Absolute growth parameters gave high growth rate values (males: $L_{inf} = 30$ mm; $K = 0.742$; $t_0 = -0.5$. females: $L_{inf} = 43$ mm; $K = 0.419$; $t_0 = 0.114$. $m + f$: $L_{inf} = 45$ mm; $K = 0.344$; $t_0 = -0.057$), which were higher in males. The sexual ratio showed that, after an initial stage (19-27 mm) where males predominated significantly, females started to dominate significantly throughout the whole range of sizes above 28.0 mm CL. Ripe

females were found throughout the year with two peaks of activity, one from June to July and another from October to November. The percentages of maturity by size class showed a 50% size at first maturity of 25.3 mm for females. Therefore, the maturation stage would have to take place within the second year of life, with a life expectancy of five years.

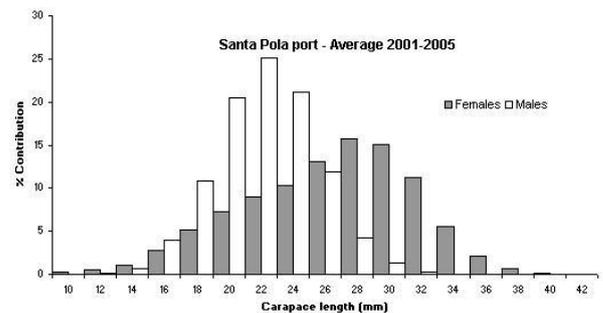


Fig. 1. Average percentage contribution (2001-2005) by size class and sex, of *Parapenaeus longirostris* landings in the Santa Pola port.

References

- 1 - Abello, P., A. Abella, A. Adamidou, S. Jukic-Peladic, P. Maiorano and M. T. Spedicato, 2002. Geographical patterns in abundance and population structure of *Nephrops norvegicus* and *Parapenaeus longirostris* (Crustacea: Decapoda) along the European Mediterranean coasts. *Scientia Marina*, 66: 125-141.
- 2 - Sbrana, M., C. Viva and P. Belcari, 2006. Fishery of the deep-water rose shrimp *Parapenaeus longirostris* (Lucas, 1846) (Crustacea: decapoda) in the northern Tyrrhenian Sea (western Mediterranean). *Hydrobiologia*, 557:135-144.