

L. CASCIARO, P. GAUDIO, I. BITETTO, M.T. FACCHINI, M. PALMISANO, P. CARBONARA

COISPA Tecnologia & Ricerca, Stazione Sperimentale per lo Studio delle Risorse del Mare,
Via dei Trulli, 18-20 - 70126 Bari, Italia.
casciaro@coispa.it

CATCH STRUCTURE AND REPRODUCTIVE PATTERN OF *MELICERTUS KERATHURUS* IN THE SOUTH-WEST ADRIATIC SEA

CICLO RIPRODUTTIVO E STRUTTURA DEMOGRAFICA DELLA CATTURA DI MELICERTUS KERATHURUS IN ADRIATICO MERIDIONALE

Abstract - Demographic structure of catches and size at first maturity of *Melicertus kerathurus* (Forskål, 1775) females (38.525 ± 2.71 mm) were estimated from commercial fisheries data collected in the South-West Adriatic Sea, from 2011 to 2013. The length distribution of the catches shows a different pattern for the two sexes and the analysis of the maturity cycle indicated that the reproduction period is in summer.

Key-words: *Melicertus kerathurus*, reproduction, South-West Adriatic Sea.

Introduction - The Caramote shrimp is distributed in the western part of the Atlantic Ocean, from Great Britain to Angola and in the whole Mediterranean Sea, where it lives on soft bottoms of the continental shelf, less than 60 m depth (Frogliã *et al.*, 2013). In the South-West Adriatic Sea (GSA 18), the Caramote shrimp is mainly caught by the demersal trawlers. Few information on the reproductive cycle are actually available. The present study aims at estimating the demographic structure of the catches and maturity cycle of *M. kerathurus* in GSA 18.

Materials and methods - Samples of Caramote shrimp were obtained from commercial landings (Data Collection Framework, EU Reg. 199/2008). The demographic structure by sex was obtained from the length frequency distributions (LFDs) of 2011-13. The maturity stage followed the colorimetric scale proposed by Rodriguez (1985) adapted in the MEDITS Protocols: 1 (immature/virgins) with translucent/transparent gonads, 2a (virgins developing) and 2b (adults recovering) with white/cream gonads, 2c (maturing or almost matures) with gonads light-yellow/yellow-green colored, 2d (matures) with olive-green/dark-green/gray-brown gonads, 2e (resting adults) with yellowish/white gonads with possible green translucent or transparent residues. The $L_{m50\%}$ and the maturity range ($MR = L_{m75\%} - L_{m25\%}$) were estimated for females using the ogive model: $M(L) = e^{(a+bL)} / (1 + e^{(a+bL)})$, where $M(L)$ is the proportion of adults and L is the length class. Binomial generalized linear models (GLMs) with logistic link have been used to describe the proportion of adult individuals on the length as independent variable (ICES, 2008). Females were considered adults from stage 2c to 2e, immature at stage 1. The stages 2a and 2b are not included in the evaluation because they can be easily confused (ICES, 2008).

Results - The LFD (Fig. 1) showed different patterns for males and females. The quarterly maturity stage composition of adult *M. kerathurus* in GSA 18 is showed in Fig. 2a. The presence of mature specimens was recorded especially in summer, whilst post-spawning and recovering specimens occurred during winter. The maturity ogive is showed in Fig. 2b, where $L_{m50\%}$ resulted 38.5 mm and MR resulted 2.8 mm.

Conclusions - The reproduction period observed in the GSA 18 is consistent with data reported for the Ionian Sea (Conides *et al.*, 2008), the Aegean Sea (Turkmen

et al., 2006) and the Adriatic Sea (Lumare *et al.*, 2011), though in this last case samples were collected only in a restricted zone. The $L_{m50\%}$ is slightly smaller than that observed by other authors (45.2 mm Conides *et al.*, 2008; 4.8 cm Turkmen *et al.*, 2006; 45.6 mm Lumare *et al.*, 2011) and slightly higher than that observed in 1993 by Mariem (29-30 mm) in the Gulf of Gabès. These differences might be ascribed to different estimation methods applied and/or to the geographical differences.

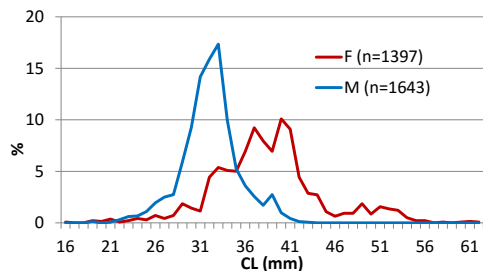
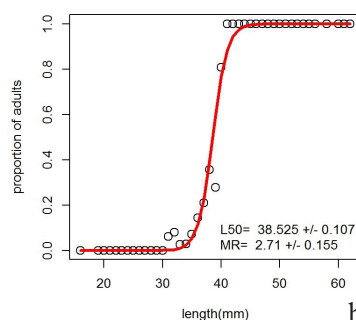
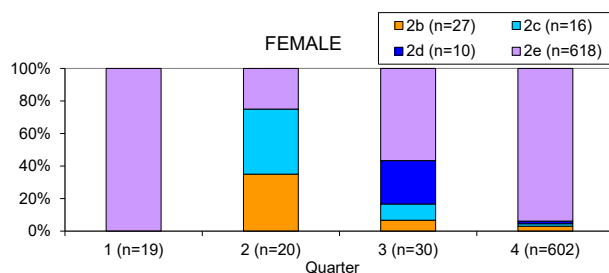


Fig. 1 - Carapace length frequency distribution of *M. kerathurus*.

Distribuzione di lunghezza carapace di *M. kerathurus*.



a

b

Fig. 2 - a) Female quarterly maturity stage composition (n=671) and b) maturity ogive of *M. kerathurus*.
a) Percentuali degli stadi di maturità (n=671) e b) ogiva di maturità per femmine di *M. kerathurus*.

References

- CONIDES A., GLAMUZINA B., DULCIC J., KAPIRIS K., JUG-DUJAKOVIC J., PAPACONSTANTINO C. (2008) - Study of the reproduction of the Karamote shrimp *Penaeus (Melicertus) kerathurus* in Amvrakikos Gulf, western Greece. *Acta Adriatica*, **49** (2): 97-106.
- FROGLIA C., SCARCELLA G., LUCCHETTI A. (2013) - On the recent increase of *Penaeus (Melicertus) kerathurus* stock in the Northern and Central Adriatic Sea: possible explanations. *Rapp. Comm. int. Mer Médit.*, **40**: 780.
- ICES (2008) - *Report of Workshop on Maturity Ogive Estimation for Stock Assessment (WKMOG)*. 3-6 June 2008 Lisbon, Portugal: 68 pp.
- LUMARE D., LUMARE L., VITALE S., LUMARE F. (2011) - Reproduction of the caramote shrimp *Melicertus kerathurus* (Decapoda, Penaeida) in the South Adriatic Sea (South-Eastern Coast of Italy). *Crustaceana*, **84** (3): 293-305.
- MARIEM S.B. (1993) - Taille de première maturité et période de ponte de *Penaeus kerathurus* dans le Golfe de Gabès, Tunisie. *Crustaceana*, **65** (1): 82-96.
- RODRIGUEZ A. (1985) - Biología del langostino *Penaeus kerathurus* (Forskål, 1775) del golfo de Cádiz. I. Reproducción. *Inv. Pesq.*, **49** (4): 581-595.
- TURKMEN G., OZDEN O., PARUG S., AKALIN S. (2006) - Some reproductive aspects of *Melicertus kerathurus* (Forskål, 1775) (Decapoda, Penaeidae) inhabiting the Gulluk Bay (Aegean Sea) of Turkey. *J. Appl. Biol. Sci.*, **1** (1): 69-74.

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