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SEXUAL MATURITY OF THE HORNED OCTOPUS *ELEDONE CIRRHOSA* (LAMARCK, 1798)

MATURITÀ SESSUALE DEL MOSCARDINO BIANCO ELEDONE CIRRHOSA *(LAMARCK, 1798)*

Abstract *– Data collected from the commercial landings in the central-southern Tyrrhenian Sea (GSA 10) and in the South Adriatic Sea (GSA 18) allowed to estimate the size at first maturity of both sexes of* Eledone cirrhosa *(GSA10: female 9.1±0.11 cm; male 8.8±0.09 cm, GSA18: male 7.8±0.05 cm, female 9.7±0.06 cm). Analyses of the maturity cycle in the GSA 18 indicated that the reproduction period was occurring in the summer season.*

Key-words: E. cirrhosa*, maturity, South Adriatic, central-southern Tyrrhenian.*

Introduction – The horned octopus *Eledone cirrhosa* (Lamarck, 1798) is common in whole Mediterranean Sea, where it represents one of the most important resource of the demersal fisheries mainly caught by bottom trawlers. This species shows a very wide bathymetric distribution with a higher occurrence within 300 m depth (Belcari *et al*., 2002). The reproductive biology is characterized by a single reproductive event during the whole life span (semelparous species) (Cuccu *et al*., 2003; Orsi Relini *et al*., 2006).

Materials and methods – Samples of *E. cirrhosa* were collected during the Data Collection Framework (DCF, EU Reg. 1543/2000, 1639/2001 and 1581/2004) in two geographical sub-areas: the central-southern Tyrrhenian Sea (GSA 10; data series: 2006-2008) and the south Adriatic Sea (GSA 18; data series 2007-2008). In each specimen mantle length (ML, in cm) and sex were recorded; the maturity stage was determined following the MEDITS maturity scale (Relini *et al*., 2008). In order to estimate the length at first maturity of females (GSA 10, n= 473; GSA 18, n= 1845) and males (GSA 10, n= 497; GSA 18, n= 1453), the specimens were considered mature whether classified as 2b, 3a and 3b, whilst immature ones were those classified as 1 and 2a. The length at first maturity ($ML_{50\%}$) and the maturity range ($MR= ML_{75\%}-ML_{25\%}$) were estimated using an ogive model: $M(L)= [e^{(a+bL)}/ 1+e^{(a+bL)}]$; where M(L) is the proportion of mature individuals and L the length class. To fit the model to the data the coefficients *a* and *b* of the logistic curve were first obtained from a linear regression: $\ln[M(L)/ 1 - M(L)]= a + b(L)$ and then used as seed values to maximize the *ln*-likelihood estimator: $\Sigma \{n_{L1} \ln (M(L)) + n_{L2} \ln[1 - M(L)]\}$. The monthly distributions of the maturity stages for both females and males were calculated only for GSA18, where data were more regularly distributed along the year.

Results – The monthly percentages of maturity stages in the South Adriatic Sea showed the dominant presence of immature individuals during the autumn-winter period (62-100% from October to May for females; 66-95% from October to January for males), while in spring-summer the occurrence of mature or maturing individuals was higher (89-100% from June to August for females; 74-97% from March to August for males). The lengths at first maturity of females and males were respectively 9.1±0.11 (MR= 0.9±0.11 cm) and 8.8±0.09 cm (MR= 1.2±0.12 cm) in the central-

southern Tyrrhenian Sea, whilst in the south Adriatic the estimates for females and males were respectively 9.7±0.06 (MR= 1.5±0.07 cm) and 7.8±0.05 cm (MR= 1.4±0.07 cm) (Fig. 1).

Conclusions – The reproductive period observed in this work is in accord with the findings in other Mediterranean areas (e.g. Cuccu *et al*., 2003; Orsi Relini *et al*., 2006). The sexual maturation (stage 2b onwards) occurs early in males (from November) than in females (April). The peak of spawning takes place in summer, while during autumn there are few mature and large specimens defined as "*late spawner*" (Cuccu *et al*., 2003; Orsi Relini *et al*., 2006). The size at first maturity estimated for the GSA10 is greater than that reported by Cuccu *et al*. (2003), whilst the $ML_{50\%}$ estimated in the GSA 18 is smaller than that reported by Soro and Piccinetti Manfrin (1989). These differences might be ascribed to the diverse methods applied for the size at first maturity estimation. Due to the semelparous sexual biology of this species, it is important to take into account not only the size at first maturity, but also the Maturity Range, in order to assess the percentage of spawning biomass to be preserved for a sustainable management of this resource.

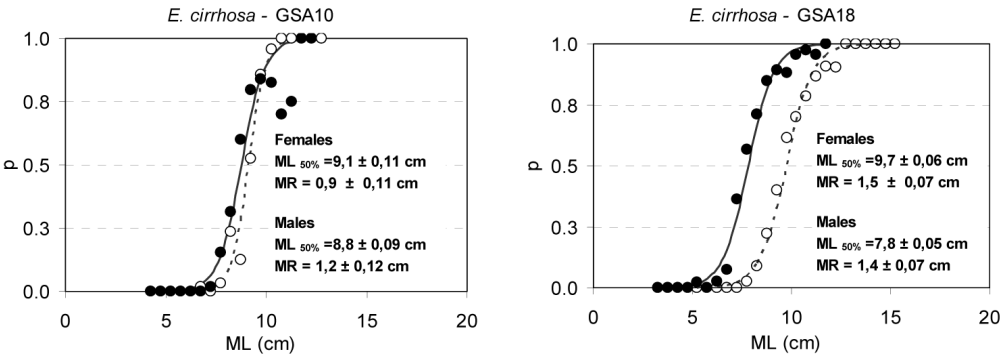

Fig. 1 - Maturity ogives of females (---; ○) and males (–;●) of *E. cirrhosa* (GSA10 and GSA18).
Ogive di maturità di femmine (---; ○) e maschi (–;●) di E. cirrhosa *(GSA10 and GSA18).*

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