



SCIENTIFIC COUNCIL MEETING – SEPTEMBER 2002

Segregation of the Mediterranean Population of *Centroscyrmnus coelolepis*
(Chondrichthyes: Squalidae): a Description and Survey
(Elasmobranch Fisheries – Poster)

S. Clò¹, M. Dalù¹, R. Danovaro² and M. Vacchi¹

¹ ICRAM, via di Casalotti 300, I-00166 Roma (simshark@libero.it)

² Istituto Scienze del Mare, Università di Ancona.

Abstract

We formulate the hypothesis that Mediterranean specimens of *Centroscyrmnus coelolepis* belong to a segregated population. Based on our data and literature we show that Mediterranean specimens have a marked lower size and a preferential deeper distribution than Pacific and Atlantic populations. Some biological data on reproduction are given for this deep-shark poorly studied in Mediterranean.

Key-words: deep-shark, *Centroscyrmnus coelolepis*, population identity, reproduction

Introduction

The Portuguese dogfish *Centroscyrmnus coelolepis* Bocage and Capello, 1864, is a widely distributed deep-water shark caught in the deep range 270-3 700 m (Compagno, 1984). The maximum size of this shark is 122 cm TL (Girard and Du Buit, 1999). Fishing occurs with bottom trawls and deep longlines, it is mostly found in eastern Atlantic markets where it is commercialised fresh or dried salted for human consumption. Just a few studies reports data for this species in Mediterranean (Moureau, 1881; Roule, 1912, 1919; Grey, 1956; Torchio and Michelangeli, 1971; Albertelli and Drago, 1991; Carrasson *et al.*, 1992). In this area, *C. coelolepis* was caught only from depths deeper than 1350 m to a maximum depth of 2 863 m (Grey, 1956) (2 853 m depth, this study), while the maximum total length recorded was at 65 cm (Roule, 1912).

Material and Methods

Sample was collected during three ADIOS cruises, at three stations in western Mediterranean: St. 1: 2 853 m depth., 39°25'N, 06°04'E; St. 2: 2 850 m depth., 38°14'N, 07°09'E; St. 3: 2 798 m depth., 38°18'N, 07°50'E. Different baited traps deployments were used: two trunks conical and one cylindrical trap had the following characteristics 100 cm in length and 50 cm of diameter and a single funnel opening of 10 cm diameter. One cylindrical trap was 250 cm length and 100 of diameter with a opening of 20 cm. Fishing time was from 36 to 72 hours. Fish catch consisted of 46 specimens, 36 female and 10 males. All specimens were dissected for biological analysis. Sexual maturity was determinated according Girard and Du Buit (1999, adapted from Stehmann, 1987).

Results

Fish size in our sample ranged between 320-650 mm TL in females and 346-560 mm TL in males (Fig. 1). We used different baited traps deployments, for this matter our sample can reflect the actual population size range. The maximum size in our sample (TL = 650 mm) is like the maximum length recorded from Mediterranean for this species (Roule, 1912). Carrasson *et al.* (1992), surveying by trawls to 2 251 m depth, sampled specimens not exceeding 600 mm TL. The maximum length recorded from Mediterranean is notably less than the maximum size reported for this species (1 220 mm LT, Girard and Du Buit, 1999). Observation on the minimum size at maturity in our sample indicates a marked distinctness of Mediterranean specimens respect to Atlantic and Pacific populations. As a consequence, as shown in Fig. 2, the sexual maturity in our sample is markedly achieved at a lower size than

estimated for the NE Atlantic (Girard and Du Buit, 1999) and NW Pacific (Yano and Tanaka, 1984). Despite sexual maturity size is less than recorded for Atlantic and Pacific the maximum diameter of ripe ova for our sample (47 mm) is not too different (50-60 mm). Size at birth in Mediterranean must be deduced by literature. Moureau (1881) measured embryos of 100 mm TL, Torchio and Michelangeli (1971) describe a new born at 225 mm TL, Carrasson *et al.* (1992) caught fish from 190 mm TL, when for NE Atlantic size at birth is estimated at approximately 300 mm (Girard and Du Buit, 1999).

Bathymetric distribution for *C. coelolepis* in Mediterranean is not well known. Only three works report bathymetric data on catches of this species (Roule, 1912, 1919; Grey, 1956; Carrasson *et al.*, 1992). *Centroscymnus coelolepis* was found only in the lower slope, between the depth range 1350-2700 m. Our sample was caught at 2850 m depth. On the contrary, in Atlantic and Pacific *C. Coelolepis* is caught at 3000 m depth, but is more abundant at less depth range than the Mediterranean (400-1000 m depth in Pacific; 900-1400 m depth in Atlantic). Yano and Tanaka (1988) and Girard and Du Buit (1999) report a preferential distribution of young specimens at greater depths and of pregnant females in the upper strata. No clear segregation by size, sex and development stage can be described for Mediterranean.

Conclusion

From our data, it is possible to hypothesize that the Mediterranean specimens of *Centroscymnus coelolepis* belonged to a segregated population, different from Atlantic one. Despite NE Atlantic and NW Pacific population, our size range is below and the sharks were caught in the deeper slope. The present work provides data concerning population size and reproductive biology.

Further investigations focused in this aspect will be useful in order to formulate suitable plans of protection of deeper sharks.

Acknowledgements

This work was carried out in the framework of the program ADIOS Atmospheric Deposition and Impact of Pollution, Key elements and nutrients on the open Mediterranean Sea. Financial Support by EU (EVK3-CT-2000-00035), CoNISMa - ULR Ancona is a Partner.

References

- ALBERTELLI G., and N. DRAGO. 1991. Indagini preliminari sulla fauna batiale (Mare di Sardegna). *Atti dell'8° Congresso AIOL*. Pallanza 1-3 giugno 1988, Bregant D, Fanzutti GP eds., **8**: 53-58.
- CARRASSON M., C. STEFANESCU, and J. E. CARTES. 1992. Diets and bathymetric distributions of two bathyal sharks of the Catalan deep sea (western Mediterranean). *Marine Ecology Progress Series*. **82**: 21-30.
- COMPAGNO L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date, Part I. *Fisheries Synopsis, FAO.*, **125**, 249 p.
- GIRARD M., and M-H. DU BUIT. 1999. Reproductive biology of two deep-water sharks from the British Isles, *Centroscymnus coelolepis* and *Centrophorus squamosus* (Chondrichthyes: Squalidae). *Journal of the Marine Biological Association, UK*. **79**: 923-931.
- GREY, M. 1956. The distribution of fishes found below a depth of 2000 m. *Fieldiana, Zool.*, **36** (2): 75-183.
- MOUREAU. 1881. Histoire naturelle des Poissons de la France. Paris. Vol 1.
- ROULE L. 1912. Notice sur les Selaciens conservés dans les collections du Musée Oceanographique. *Bulletin de l'Institut Oceanographique.*, **243**: 1-36.
- ROULE, L. 1919. Poissons provenant des croisières du yacht "Princesse Alice" (1891-1919) et du yacht "Hirondelle II" (1914). *Res. Camp. Sci. Monaco.*, **52**, 190 p.
- STEHMANN, M. 1987. Quick and dirty tabulation of stomach contents and maturity stages for skates (Rajidae, squaloid and other ovoviviparous and viviparous species of sharks). *American Elasmobranch Society Newsletter*, **3**: 5-9.
- TORCHIO M., and M. MICHELANGELI. 1971. Prima segnalazione in acque italiane di uno squalide del genere *Centroscymnus*. *Natura*. Milano, **62** (3): 241-245.
- YANO K., and S. TANAKA. 1988. Size at maturity, reproduction cycle, fecundity, and depth segregation of the deep sea squaloid sharks *Centroscymnus owstoni* and *Centroscymnus coelolepis* in Suruga Bay, Japan. *Nippon Suisan Gakkaishi*, **54**: 167-174.

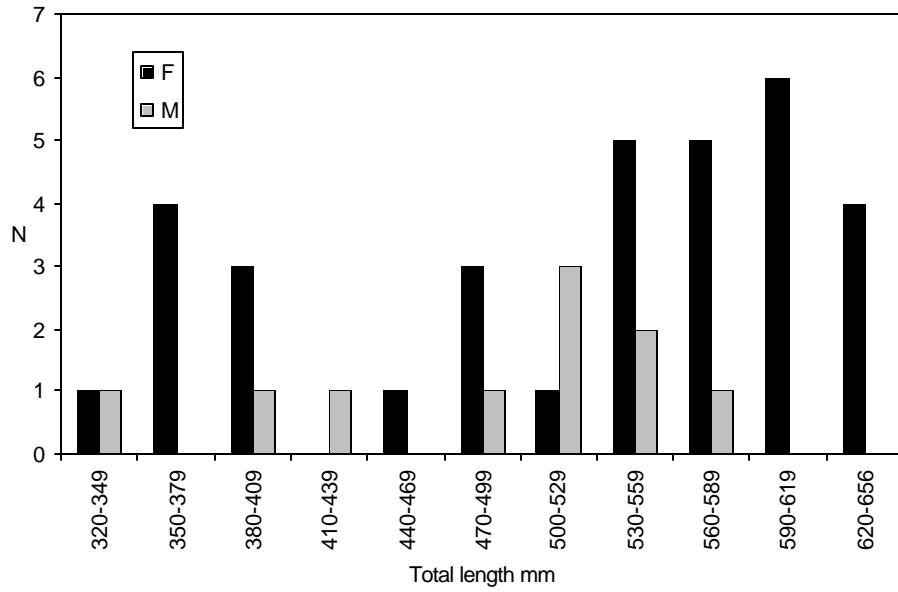


Fig. 1. Size Frequency distribution by sex.

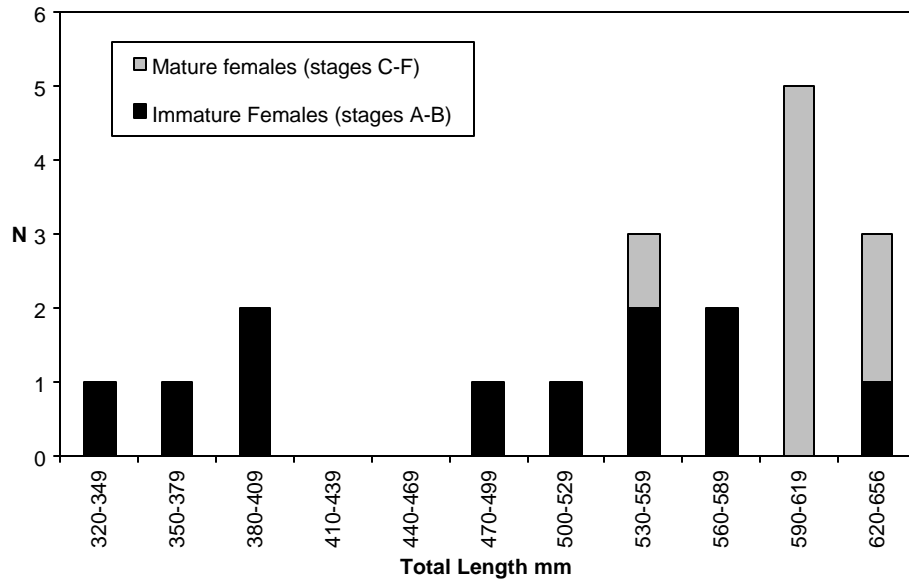


Fig. 2. Size frequency distributions of females by maturity stage.