MEDUSIVOROUS FISHES OF THE LIGURIAN SEA 3. THE YOUNG GIANT, *MOLA MOLA* AT THE CAMOGLI TUNA TRAP

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Abstract
The fishery of *Mola mola* occurred in the Ligurian Sea from ancient times to the end of the '90s when the use of *M. mola* as food was banned by the European Community. *M. Mola* was fished at the small artisanal tuna trap of Camogli, a very ancient gear at present located in the Portofino MPA. We used literature data (commercial product in the periods: 1950-1974, 1996-2000) and original unpublished data size structures per month (1993-1995; fillets/fish ratio) to estimate numbers of fish caught during the past exploitation. These were very young fish whose utilization can be traced at least one century ago. The Camogli tuna trap has allowed the monitoring, albeit in relatively short time periods, of the abundance of seven species of regular (*M. mola*) or potential medusivorous fish.
Keywords: Western Mediterranean, Fisheries, Coastal Waters

Among medusivorous fish (1), the sunfish *Mola mola* (Linnaeus, 1758) is classified in the group of species which feed only on jellyfish or use a prevailing quantity of this prey; the latter category seems the most appropriate for *M. mola*. The use of gelatinous macroplankton allows fast growth and the attainment of the most relevant size among living bony fish; a parallel case can be found in the marine turtles, with *Dermochelys coriacea*. In the last ten years, these characteristics have promoted a renewed interest to *M. mola* and the development of new research lines, especially based on archival tags and satellite tracking: the reason is that "data on what environmental factors influence the abundance and distribution of *M. mola* can also offer additional insight into what may be influencing the availability and blooms of gelatinous prey species" (2). However *M. mola* remains a poorly known species, particularly in the Mediterranean. Reproduction, in terms of times and locations, remains a major gap of its life history (3) and also distribution is scarcely understood. At the best of authors knowledge, *M. mola* results really abundant in few Mediterranean areas: one is located in the Ligurian Sea, at Camogli (western side of Portofino promontory), where fishermen still use an ancient two-chambered artisanal tuna trap (six men crew for hauls). This gear was common about four centuries ago along the Ligurian coast, from Marseille (4) to La Spezia. The trap is active from April to September, with three hauls per day. Until 2000 (5), commercial landings per fishery season resulted about 50 tons, and included more than 40 fish species, with a *Mola* product of about 2 tons, but at present, due to E.C. regulations, this fish cannot be used as food and is released alive. Parona (6), during a local visit in June 1912, recorded more than 500 individuals of *Mola* in the trap and reported that although this fish was part of the commercial product, sometimes its abundance reached numbers considered by fishermen unfavourable for the fishing of bluefin. Total catches of the tuna trap were studied in the '70s (7), thanks to the daily registration of the commercial products carried out from 1950 onward by the same fishermen who were experimenting different kinds of net in the trap chambers. Two form of CPUE (a proxy of fish abundance) were derived: total landings per fishery season and average daily landing of the top ten species in a time series of 25 years, from 1950 to 1974: the species were *Auxis rochei, Boops boops, Sarpa salpa, M. mola, Oblada melanura, Sarda sarda, Scomber japonicus, Scomber scombrus, Scomberesox saurus, Trachurus trachurus* (7). *M. mola* was registered with quantities varying between 0.86 and 5.84 tons per fishery season (164-182 days of fishing). In the study of the fishery trends of the top species *M. mola* resulted one of the most regular (7), uninfluenced by materials used in the gear construction. In the period 1993-1995, thanks to an E.C. funding regarding large pelagic fish, we studied the size structure of the fished stocks by different gears, including the Camogli tuna trap. Observations regarding *M. mola* (an example of l/f distribution is given in fig. 1), that was not a target species, remained unpublished. At present large numbers of fish are observed as at the time of Parona (6), but in absence of fishing, it is impossible to quantify their presence (8). Moreover the quantities registered from 1950 to 2000, don't regard directly the fish, but its commercial form, the fillets. Which is the ratio fish-fillets? From the structure of the fished stock we have obtained the average fish, 45.4 cm total length and about 5 kg weight (9), supposed in the first year of life. This represents the modal size in June that is the core of the fishing season. In this month we have observed the preparation of fillets: an average of 0.82 kg of product per specimen (N=80; range 36-75 TL) that is the 16.4% of the fished biomass. Such data allow to transform the above indicated total catches in number of fish: in the 25 years series the range was about 1000-7100 fishes with an average of 3626 per fishery season and at the end of the '90s the average catch was consisting of about 2436 fishes. We cannot say if this number represent a decrease in respect of the past series because in the years 1950-1960 seven annual catches resulted under this level (7): the indicated time period is not suspected in regard of the other gears which can capture the sunfish i.e. driftnets, which were developed in the '80s. Taking into account the list of Mediterranean medusivorous fish (10), we can observe that the Camogli tuna trap till recent times was permitting the monitoring of seven species of regular and potential medusivorous fish: at present the monitoring of *M. mola* is cancelled as well as an ancient know how regarding the fish and the possibility to offer the sun (in english) or the moon (in italian pesce luna) on the table at Portofino. Given the present relevance of this species for research at ocean scale (2) we suggest to open a debate on this subject.

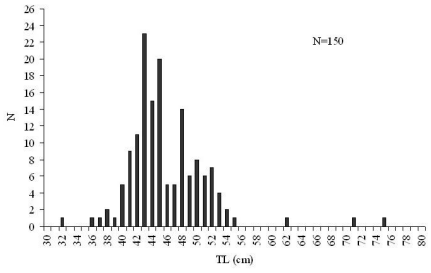

Fig. 1. Length/frequency distribution of *M. mola*, caught by the Camogli tuna trap (sum of hauls carried out in May-July 1993).

References
1 - Ates R.M.L., 1988. Medusivorous fishes, a review. *Zool. Meded*., 62: 29-42.
2 - Thys T., Dewar H., Farwell C., O'Sullivan J., Wang K., Walli A., Teo S., Tobayama T., Soichi M., Kondo Y., Okada Y. and Nakatsubo T., 2007. Tracking the world largest jelly predator, *Mola mola*, in the Eastern and Western Pacific. Second International Symposium on tagging and tracking marine fish with electronic devices, October 8-11, San Sebastian, Spain: 113.
3 - Tortonese E., 1956. Iniomi, Plectognathi in Uova, larve e stadi giovanili di Teleostei. *Fauna Flora Golfo di Napoli*, 38: 979-989.
4 - Mouton, 2004. Le thon de la Méditerranée. Edisud. Aix-en-Provence. pp. 140.
5 - Relini M., 2001. Changes in a north western Mediterranean fish coastal assemblage on the basis of the catches of the Camogli tuna trap. *Rapp. Comm. int. Mer Médit.*, 36: 314.
6 - Parona C., 1919. Il tonno e la sua pesca. *Mem. R. Com. Talass. Ital.*, Venezia, pp. 265.
7 - Balestra V., Boero F. and Carli A., 1976. Andamento del pescato della Tonnarella di Camogli dal 1950 al 1974.. Valutazioni bio-statistiche. *Bollettino di Pesca, Pescicoltura e Idrobiologia*, 31: 105-115.
8 - Cattaneo-Vietti R. and Bava S. (a cura di), 2009. La tonnarella e la pesca tradizionale a Camogli. *Microart's Recco* (Genoa), pp. 143.
9 - Watanabe Y. and Sato K., 2008. Functional Dorsoventral Symmetry in Relation to Lift-Based Swimming in the Ocean Sunfish *Mola mola*. *PLoS ONE* 3 (10): 1-7.
10 - Orsi Relini L., Garibaldi F., Lanteri L., Relini M., 2010. Medusivorous fishes of the Ligurian Sea 1. Chub mackerels and other pelagic fish species sometimes "have the medusa" *Pelagia noctiluca*. *Rapp. Comm. int. Mer Médit.*