SPATIO-TEMPORAL CATCH VARIATION OF THE SPINY LOBSTER (*PALINURUS ELEPHAS*): IMPLICATIONS FOR THE MANAGEMENT IN CALVI/CAP CORSE

Michel Marengo [1]*, Laura Iborra [1], Nicolas Tomasi [2], Maddy Cancemi [2] and Sylvie Gobert [3]
[1] STARESO Marine research station - michel.marengo@stareso.com
[2] Parcu Naturale Marinu di u CapiCorsu è di l'Agriate (PNMCCA)
[3] Université de Liège (ULiège)

Abstract
The spiny lobster (*Palinurus elephas, Fabricius, 1787*) is an emblematic species of the Mediterranean Sea. The main objective of this study will be to improve the state of knowledge on the exploitation of this species in Calvi/Cap Corse. The artisanal fishing of spiny lobster in the study area has remained relatively stable (CPUE) in recent years (2004-15).

Keywords: Fisheries, Corsica Trough

The spiny lobster (*Palinurus elephas, Fabricius, 1787*) is an emblematic species of the Mediterranean Sea. According to the International Union for Conservation of Nature (IUCN), overexploitation by professional fishing is a major threat to this species worldwide. It has been assessed as a " Vulnerable " species in the Red List of Threatened Species. In the Mediterranean, for more than 30 years, landings of spiny lobster have declined significantly by between 30 and 50%. In Corsica, the same trend is observed, going from an average production of 300 tons per year in the 1970s to nearly 80 tons estimated during the 2000s (Le Manach et al. 2011).

The main objective of this study will be to improve the state of knowledge on the exploitation of this species in Calvi/Cap Corse, in order to contribute to sustainable fisheries management. Data were collected by scientific observers on-board fishing vessels (see Marengo et al. 2016). In this study, 12 years of monitoring between 2004 and 2015 were analyzed during the peak fishing season (between April and September). A total of 466 fishing trips were performed in the perimeter of the *Parcu Naturale Marinu di u CapiCorsu è di l'Agriate* (PNMCCA, Marine Nature Park), which represents nearly 1300 km of nets sampled over the 12 years (Fig.1). The PNMCCA was created by decree on July 15, 2016. It is the eighth largest French Marine Nature Park of 6,830 km², is the largest marine natural park in metropolitan France.

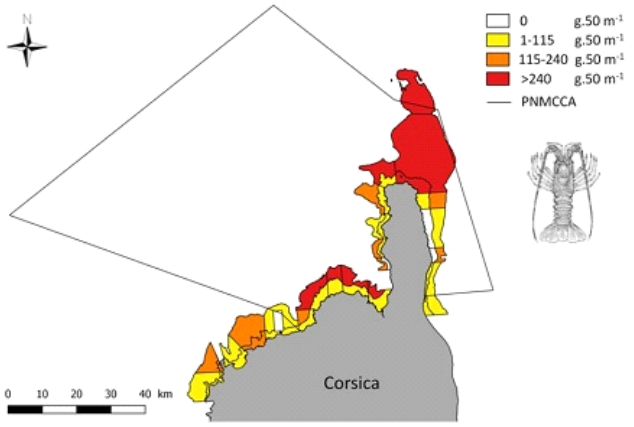

Fig. 1. Spatial distribution of fishing zones based on CPUE (expressed in g.50m^{-1}) between 2004 and 2015 for spiny lobster exploited by artisanal fisheries.

Analysis of the evolution of CPUE in spiny lobster nets revealed no temporal trend, with stable yield over time. CPUE ranged from a low of 208 g.50 m^{-1} in 2009 to a high of 277 g.50 m^{-1} in 2014. The spatial distribution of fishing areas shows that spiny lobster is distributed heterogeneously in the study site. It is generally observed that the lowest CPUE values are between 0 and 50 m deep (eg Canari, Pino, Santa Severa) while the maximum values are mainly between 50 and 200 m depth. The highest CPUEs are mainly located in the north of Cap Corse and in the west towards Agriates (Fig. 2). This "hot spots" of exploitation have been identified, these zones correspond to CPUE values greater than or equal to 240 g.50 m^{-1} (Agriates, Giraglia, Malfacu, Saint-Florent, Saleccia, Semaphore, Veuves).

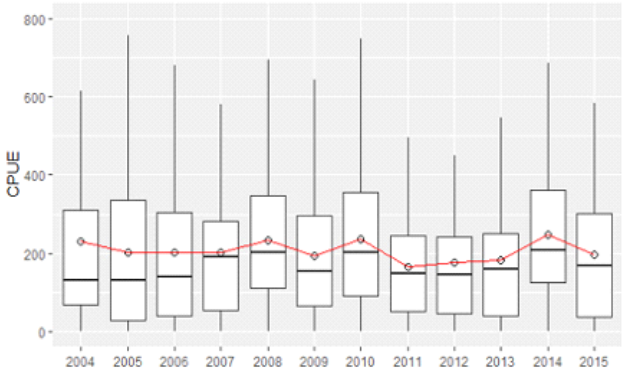

Fig. 2. Evolution of CPUE (expressed in g.50m^{-1}) of spiny lobster between 2004 and 2015.

In conclusion, artisanal fishing of spiny lobster in the Calvi / Cap Corse area has remained relatively stable (CPUE) in recent years (2004-15). In this context, the scientific recommendations for the sustainable exploitation of the resource are essentially the strict respect of the regulations already in force.
To date, the regulations in Corsica include:
(i) a fishing season open between March 1st and September 30th;
(ii) a minimum landing size of 240 mm total length (90 mm cephalothoracic length: CL);
(iii) a ban on the retention and marketing of females, irrespective of age and size;
(iv) a total length of the nets per vessel not exceeding 5000 m. Finally, despite the existence of fisheries data on the artisanal fishery for P. elephas, there is a lack of knowledge about its biology and key elements of its life cycle (population structure, displacement, age, growth, maturity sexual, recruitment, larval stage...).

In this approach, it would be interesting to continue the fishery monitoring with the help of professional fishermen, by increasing the sampling effort on this area.

References
1 - Le Manach F, Dura D, Pere A, Riutort J-J, Lejeune P, Santoni M-C, Culioli J-M, Pauly D (2011) Preliminary estimate of total marine fisheries catches in Corsica. Fisheries Centre Research Reports 19:3
2 - Marengo, M., Pere, A., Marchand, B., Lejeune, P., & Durieux, E. D. (2016). Catch variation and demographic structure of common dentex (Sparidae) exploited by Mediterranean artisanal fisheries. *Bulletin of Marine Science*, *92*(2), 191-206.