



The artisanal fishery of the spiny lobster *Palinurus elephas* in Cabrera National Park, Spain: Comparative study on traditional and modern traps with trammel nets



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ABSTRACT

Cabrera National Park is a Marine Protected Area (MPA) located in the South of Mallorca, Balearic Islands, Spain. It has a valuable ground fishery that includes several species of crustaceans of commercial interest, such as the European spiny lobster *Palinurus elephas*. Lobster traps, although permitted and even promoted by the park's authorities, have been abandoned due to the higher efficiency and catch per unit effort of the trammel nets. This study evaluates traditional and modern lobster trap designs to determine the most suitable one as an alternative to trammel nets. The gear was first tested in an aquarium and consisted of a reed trap, a plastic trap and a metal trap, all three historically used in Mallorca, and a modern Japanese collapsible trap. By conducting behavioral observations and exposing 40 lobsters to the traps it was found that the collapsible trap captured 20% of the lobster exposed to the trap, while the plastic trap only 10% and the reed and metal trap only 2.5% and 0%, respectively. In addition, experimental trials were conducted in a fishing ground of Cabrera National Park using two 450 m long strings of traps. Each string was composed of 30 collapsible traps or 30 plastic traps, with traps spaced at 15 m intervals along the line. Lobster catches were 24 (0.8 lobster/450 m) in the plastic traps, but only 9 (0.3 lobster/450 m) in the collapsible ones. When considering that the minimum legal size for lobsters is larger than 9 cm carapace length (CL), only 9 lobster (0.3 lobster/450 m) could be landed after deploying 1800 traps, and all of them coming from plastic ones. To compare the effectiveness of traps with lobster trammel nets, 14 fishing operations were carried out with a total of 5950 m of net deployed. Thirty-three lobsters were captured (2.37 lobster/450 m) in the nets, of which only 17 reached commercial size (1.22 lobster/450 m). Although the collapsible trap has caught more lobsters in the aquarium compared to the plastic trap, the plastic trap performed better in the field. This appears to be due to the effects of bycatch species, particularly octopus. Our results stressed the necessity of implementing an evaluation of the lobster population dynamics to design more efficient management measures. The fishers themselves recognize the need to an agreement for changing the paradigm from maximizing catches to maximizing profit.

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1. Introduction

Cabrera National Park (CNP) (Balearic Islands, western Mediterranean) is a UICN category II Marine Protected Area (MPA) that is located in the southeastern coast of Mallorca, Balearic Islands, Spain (Fig. 1). The Cabrera Archipelago was constituted as a National Park in 1991, and includes an extensive MPA (87.03 Km²). The lit-

toral zone of the archipelago is characterized by its oligotrophy, accentuated by the low continental influence, and consequently by an elevated water transparency comparable, during the summer season to that found in tropical seas (Ballesteros and Zabala, 1993). Oceanographic data indicate there is summer water column stratification, horizontal distribution of the water masses and hydrodynamic features linked with Mediterranean seasonality (Crec'hriou et al., 2010; Basterretxea et al., 2010).

Recreational fishing and trawling were forbidden on the Park Management Plan in 1992, while small-scale fishing was regulated in 1995 and revised in 2001 (BOE 214, 2001). A total of

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84 small-scale boats from the neighboring towns of Palma, Colonia Sant Jordi, Santanyi and Portocolom (Fig. 1), which have been traditionally fishing in Cabrera waters and showed interest in con-

tinuing the activity, were allowed to fish inside the Park. The total amount of boats allowed to operate in CNP in a given day is 20. This fleet operates both in and outside CNP targeting several species of

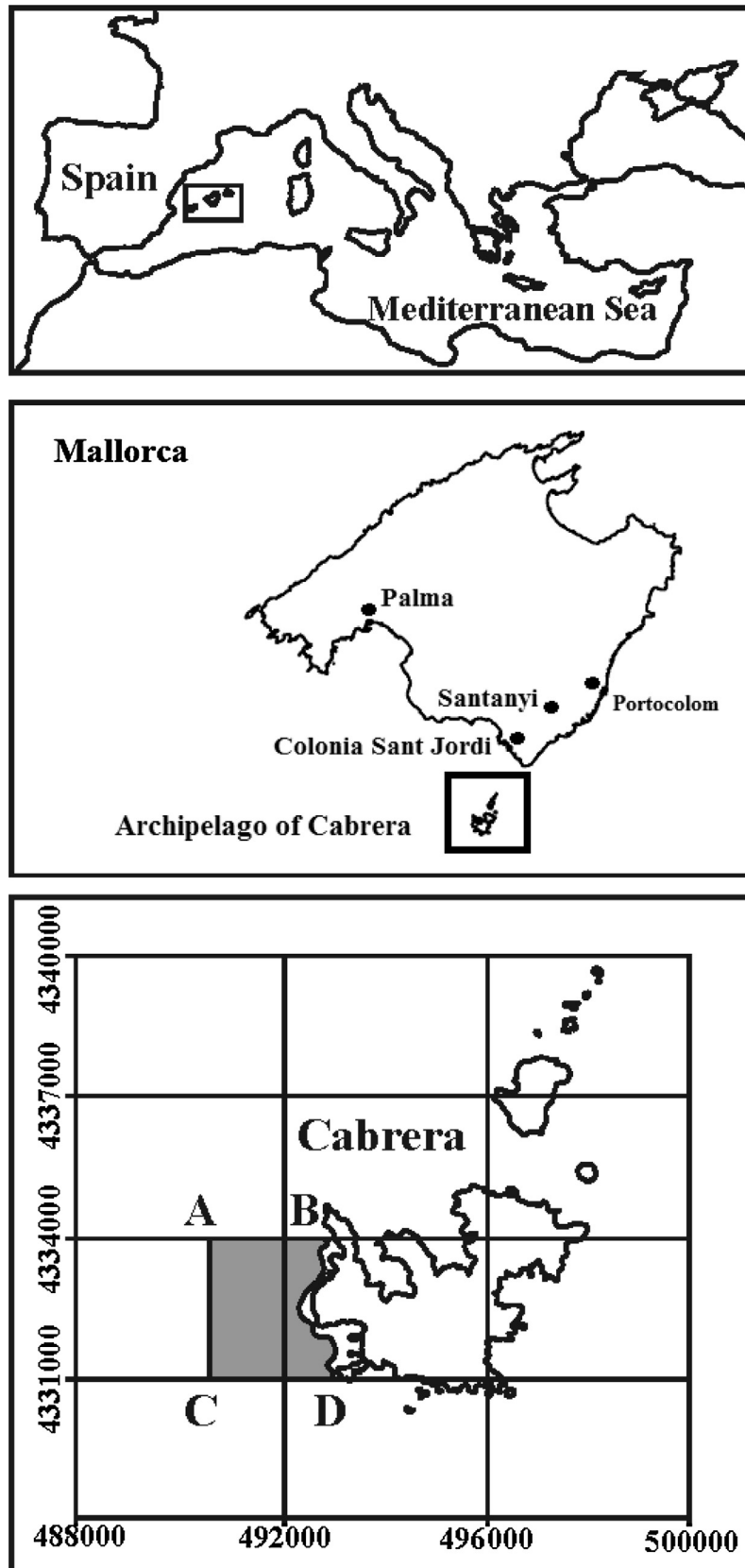


Fig. 1. Location of Cabrera National Park and area of experimental fishing (shaded). Bottom figure: x-axis longitude and y-axis latitude in UTM units.

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