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FIRST RESULTS OF THE STUDY OF THE MARINE COMPONENT OF THE NATIONAL PARK OF AL HOCEIMA (MEDITERRANEAN MOROCCO)

PRIMI RISULTATI DELLO STUDIO DELLA PARTE MARINA DEL PARCO NAZIONALE DI AL HOCEIMA (MAROCCO MEDITERRANEO)

Abstract

The elaboration of the zoning proposal and management plan of the marine part of Al Hoceima National Park carried out in the framework of the MedMPA Project, foresees data collection on a number of critical factors. The main results obtained through field activities carried out in September 2002 concerning benthic biocoenoses, ichthyofauna and protected species such as the Mediterranean monk seal and Patella ferruginea point out the environmental relevance of the study area.

Key-words: marine parks, Alboran Sea.

Introduction

The Al Hoceima National Park is located on the Mediterranean Moroccan coast, 150 km east from the Gibraltar Strait, near the city of Al Hoceima. The park, covering a coastline of 47 km, encompasses environments of high biological value and its coast is dominated by rocky impervious cliffs reaching up to 600 m. ICRAM (Istituto Centrale per la Ricerca scientifica e tecnologica Applicata al Mare) in the framework of the MedMPA project funded by the European Union and coordinated by RAC/SPA (Regional Activity Center for Specially Protected Areas), has been entrusted with the scientific coordination of the data collection necessary for the elaboration of the zoning proposal of the marine component of the National Park of Al Hoceima. This contribution regards the information collected on some critical environmental components, present within this marine coastal area.

Materials and methods

A preliminary mission was carried out in May 2002 to define the priority research activities to be conducted in future field missions. Due to the paucity of useful data, research activities were focused on the following aspects of high conservation relevance: benthic assemblages characterisation, fish species richness, presence and status of two endangered species (*Patella ferruginea* and the Mediterranean monk seal, *Monachus monachus*). The field survey was carried out in September 2002 and

involved a mixed group of scientists from Morocco, Italy and Tunisia.

A detailed cartographic map of the coastline at an approximate scale of 1:50,000 was created using a satellite LANDSAT 7 ETM + imagery, optical channel (PAN), with a resolution of 30 m. The image was georeferenced and corrected to match a Moroccan base map (1:203,000) performing an "image-to-map" registration technique (ENVI software, Research Systems, Inc.). The retrieved georeferenced coastline, digitised and imported onto GIS, was used to plan and carry out the first field campaign in September 2002.

A first geomorphological field study identified 5 main sub-homogeneous environmental units utilised to divide the coastal component of the study area (Fig. 1) so as to stratify the allocation of the field activities.

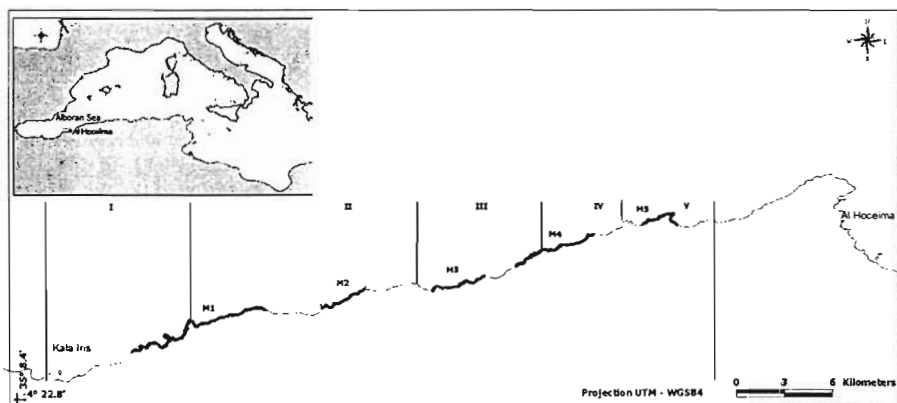


Fig. 1 - Study Area. The eastward and westward borders of the national park of Al Hoceima are shown. The 5 identified geomorphological units (I-V) and the five rocky stretches of coast patrolled for potential monk seal (*Monachus monachus*) habitat presence (M1-M5) are highlighted.

*Area di studio. Sono indicati i limiti ovest ed est del Parco Nazionale di Al Hoceima e le cinque unità geomorfologiche individuate. I tratti di costa evidenziati indicano i settori rocciosi indagati per la caratterizzazione degli habitat potenzialmente idonei alla presenza della foca monaca (*Monachus monachus*) (M1-M5).*

The benthic biocoenoses were studied through an underwater scuba diving survey. In each of the 5 sectors, 3 transects were performed moving from the coast towards offshore for 100 m. Steep zones were studied until 33 m of depth. The conspicuous macrobenthic species characterising the assemblages were identified and photographic documentation was collected in each transect.

Fish surveys were performed through 15 minute long scuba diving paths in order to acquire semi quantitative data on the fish species and size composition (Harmelin-Vivien *et al.*, 1985). Scuba diving paths were stratified on the basis of coastal units and four depth ranges (0-3; 4-7; 12-16; 24-30 m).

The presence of *Patella ferruginea* specimens throughout the coastal stretch of the study area was recorded. Morphometric (length and width) and density (number of specimens per linear meter of coast) data was collected in relation to sea wave exposition for specimens present in the Cala Iris Islet.

Monk seal coastal habitat data was collected by aquatic investigation of the main rocky cliff sectors so as to verify and document the presence of caves. Information on monk seal sightings was collected through a fishermen survey (Boyd and Stanfield, 1998).

Results

The benthos study identified 72 taxa, produced drawings of transect profiles describing bottom typology and highlighted a very particular benthic assemblage distribution characterised by the presence of deep species in shallow waters (i.e. the madreporian *Dendrophyllia ramea*, found in a depth range of 24–37 meters). Moreover the benthic algal assemblage indicates an extremely high species richness (264 taxa: 57 Chlorophyceae, 52 Fucophyceae and 155 Rhodophyceae) characterised by Eastern Atlantic species that are indicative of the particular oceanography of the area.

Fish surveys were carried out within 4 of the 5 identified sectors (Fig. 1) due to logistical difficulties. Twenty-seven paths (19 on hard bottom and 8 on soft bottom) yielded a total record of 62 species. The most well represented families are sparids and labrids with respectively 15 and 14 species. Sectors II and III were characterized by the highest number of species (n 43). The fish assemblage was characterized by medium/small sized specimens in all the coastal sectors and particularly within sectors II, III and IV.

As far as endangered species are concerned, the sea limpet (*Patella ferruginea*) was found on all the five rocky sectors of the Park. The distribution of the limpets along the perimeter of Cala Iris islet was not homogeneous. The major part of the population was concentrated in its northern sector.

Five rocky coastal sectors (M1-M5) having a potential presence of monk seal caves were identified (Fig. 1). Aquatic inspection of sectors M1 and M5 revealed 2 caves in sector M5 and its adjacent area. Each cave is characterised by an emerged internal pebble beach that is relatively well protected from sea waves. The sighting reports indicate the historical and recent presence of *M. monachus* in the coastal stretch of the study area as well as farther west as Mstassa and east to Cap de l'Eau. Two monk seal observations were recorded within the park during the last five years.

Conclusions

The present study points out the remarkable environmental value of the marine component of the Al Hoceima area. Benthic assemblages are very rich, diversified and characterised by Eastern-Atlantic species, in accordance with the results of previous studies (Benhissoune *et al.*, 2001, 2002a, 2002b). The fish assemblage is rich in species but characterized by medium/small-sized specimens. This situation could be partially related to the observed widespread use of illegal fishing with explosives.

The presence of an important population of *Patella ferruginea* points out the relevance of the study area for the conservation of this species, thereby stressing the need to carry out further specific research.

Monk seal sighting information collected from fishermen interviews indicate that some individuals may transit in / utilise part of the study area. Collected data there-

fore supports the relevance ascribed to the study area for the monk seal. In fact the presence of this very endangered species along the Mediterranean Moroccan coast was claimed to be limited to the coastal area from Al Hoceima to Cap Trois Fourches (approximately 10 individuals) (Aguilar, 1998), but no monitoring activities are currently enacted and the future management plan of the marine protected area should thus contemplate conservation initiatives for the species such as monitoring, environmental awareness and protection of specific sites.

New field activities will be carried out in summer 2003 but the already collected data, which points out the important occurrence of some highly endangered species, emphasizes the environmental relevance of this coastal area. Moreover, the peculiarity of benthic and fish assemblages of the Al Hoceima coastal area, characterised by typically Eastern-Atlantic and South-Mediterranean species, stress the importance of this Marine Park in the domain of a Mediterranean network of marine protected areas.

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