ROV OBSERVATIONS ON FISH AND MEGAFAUNA IN DEEP CORAL AREAS OF THE EASTERN IONIAN

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Abstract

Under the EU CoralFish project, investigating cold water corals in the Eastern Ionian Sea, sonar targets were surveyed with a remotely operated vehicle at depths of 440-820 m. Information on the bathymetric range, habitat, behaviour, aggregation pattern and response to the ROV is reported for approximately 30 characterising megafaunal and fish species.

Keywords: Fishes, Crustacea, Deep Sea Ecology, Ionian Sea

Introduction

The CoralFish project aims at assessing the interactions between deepwater corals, fish and fisheries, towards better ecosystem based management of European deep waters. Several areas in the North Atlantic and Mediterranean are being investigated. Rich coral communities have been described off the southeast corner of Italy [1]. Off the opposite side of this basin, in western Greece, sites are being investigated to identify and describe coral areas. Observations by remotely operated vehicle (ROV) on megafaunal organisms and their behaviour in their natural environment are reported.

Materials and Methods

The study area is situated off the west coasts of the islands of Cephalonia and Zakynthos (Greek Ionian Sea). Surveys were conducted between 300-2000 m depth in June 2009. Hull mounted multibeam sonar (Seabeam 2021 - 20 kHz) was used to map the general underwater topography, followed by deep tow operations (Geoacoustics Deep Tow 2000; Side scan 114/410 KHz; Sub-bottom Geochirp II, 1-12 kHz) in 4 selected areas. A DSSI Max Rover remotely operated vehicle (ROV) was used to make observations during 5 dives at 440-820 m depth on specific targets and target areas selected from the sonar records. The targets had high potential for deepwater coral occurrence. Live observations were made by scientists on board the support vessel and recorded material in the laboratory. Data analysis included species identification, depth range, habitat, behaviour, aggregation pattern and their reaction to the ROV.

Results

Various species of fish (*Chlorophthalmus agassizi, Hoplostethus mediterraneus, Helicolenus dactylopterus, Pagellus bogaraveo, Polyprion americanus, Phycis blennoides, Chauliodus sloanii, Lampanyctus crocodilus, Nezumia sclerorynchus, Hymenocephalus italicus, Etmopterus spinax, Nettastoma melanurum, Bathypterois mediterraneus, Stomias boa)*, decapods (*Aristaeomorpha foliacea, Aristeus antennatus, Plesionika giglioli, P. martia, P. edwardsii*), cephalopods (Teuthoidea), anthozoa (*Isidella elongata, Leiopathes glaberrima, Desmophyllum crystagalli, Funiculina quadrangularis*) echinodermata (*Stichopus regalis, Hymenodiscus coronata, Cidaris cidaris*) and cirripedia were observed during the ROV surveys. Approximately 13 individual fish, 18 decapods, 2 cephalopods, 5 cirripedia and 47 corals have not yet been identified.

Depth range distribution: species were classified as found a) mainly <500 m depth (e.g. *C. agassizi, P. bogaraveo*), b) mainly between 500-700 m (e.g. *H. dactylopterus, H. mediterraneus, A. antennatus*), c) mainly >700 m (e.g. *I. elongata, L. crocodilus, C. sloanii*) and d) in the whole depth range (e.g. *F. quadrangularis*).

Habitat: species were separated into associated with a) mud (e.g. *C. agassizi, I. elongata*) and b) rocks (e.g. *P. bogaraveo, D. crystagalli*).

Behaviour: species were characterised as a) clearly benthic (e.g. *I. elongata, C. cidaris*), b) lying inactive or moving on the bottom (e.g. *P. martia, P. giglioli, H. dactylopterus*), c) staying just above the bottom, but in close relation with it (e.g. *P. bogaraveo, P. americanus, H. mediterraneus, N. sclerorhynchus, H. italicus*), d) lying on the bottom, but also swimming in the water column (e.g. *A. antennatus, A. foliacea*) and e) swimming in the water column (e.g. Teuthoidea).

Aggregation pattern: a) species presenting a schooling pattern (e.g. *P. bogaraveo, P. gilioli*), b) the solitary ones (e.g. *P. americanus, C. sloanii*) and c) those showing a dispersed pattern (e.g. *C. agassizi, P. martia, H. mediterraneus*).

Reaction to the ROV: species were distinguished as a) remaining inactive (e.g. *C. agassizi, P. martia*), b) reacting and leaving the area (e.g. *A. foliacea*), c) reacting, but without leaving (e.g. *H. dactylopterus*) and d) attracted (e.g. Teuthoidea).

Discussion

The results of the present study confirm the megafauna in the deep waters of the Ionian Sea [2]. More species were observed in the present work, probably related to the longer duration of the ROV surveys, the larger depth range and the larger geographical area studied. Although some of the information collected in this study is already known [3 and references therein], new insights were gathered regarding the behaviour of the species. The use of ROVs allows the behavioural study of deep-water species, however, light and noise disturbance need to be considered.

References

1 - Tursi, A., Mastrototaro, F., Matarrese, A., Maiorano P., D'Onghia G., 2004. Biodiversity of the white coral reefs in the Ionian Sea (Central Mediterranean), *Chem. Ecol.* 20 (Suppl. 1): 107-116.

2 - Mytilineou, Ch., Smith C.J., Politou C.-Y., Kallergis, M., Manoussakis, L. & Papathanassiou, E., 2009. Demersal Deep-Water Species Observations During Remote Operated Vehicle Surveys. Proc. 9th Hel. Symp. *Oceanogr. & Fish.*, vol. II: 733-738.

3 - Fishbase: http:\\www.fishbase.org