

Greenpeace Pole-to-Pole expedition – Azores 2019

28th June – 3rd July 2019

(MV Esperanza)

Cruise report *Date:* 27/06/2019

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Partners: Greenpeace Pole-to-Pole expedition, IMAR Instituto do Mar, the EU ATLAS and iAtlantic projects and the FRCT MapGES project.

Vessel: MV Esperanza

Chief scientist: Marina Carreiro-Silva

Scientific team: Telmo Morato, Manuela Ramos, and Marina Carreiro-Silva

1. Introduction

The scientific deep-sea work conducted on-board the “MV ESPERANZA” and using the ROV SEAEYE COUGAR-XT aimed to visit some previously **unexplored seamounts** in the Mid Atlantic Ridge (MAR). In some of these seamount there was strong evidences of the presence of large aggregations of the bubble gum coral *Paragorgia johnsoni* and other Vulnerable Marine Ecosystem (VME) indicator taxa. These areas were located around the **Cavala seamount**; approximately 100 nm west of Horta harbour in Faial island (Figure 1).

Sampling design for the benthic deep-sea work aimed to (i) map benthic communities inhabiting unexplored seamounts in the Mid Atlantic Ridge west of Faial Island with the Seaeeye Cougar ROV, (ii) identify new areas that fit the FAO vulnerable marine ecosystems definition (or similar designations, e.g. APEIs); and (iii) to contribute with additional data to address patterns and drivers of the distribution of deep-sea benthic biodiversity in the Azores. The sampling design also allowed to collect biological samples for taxonomy and genetic studies.

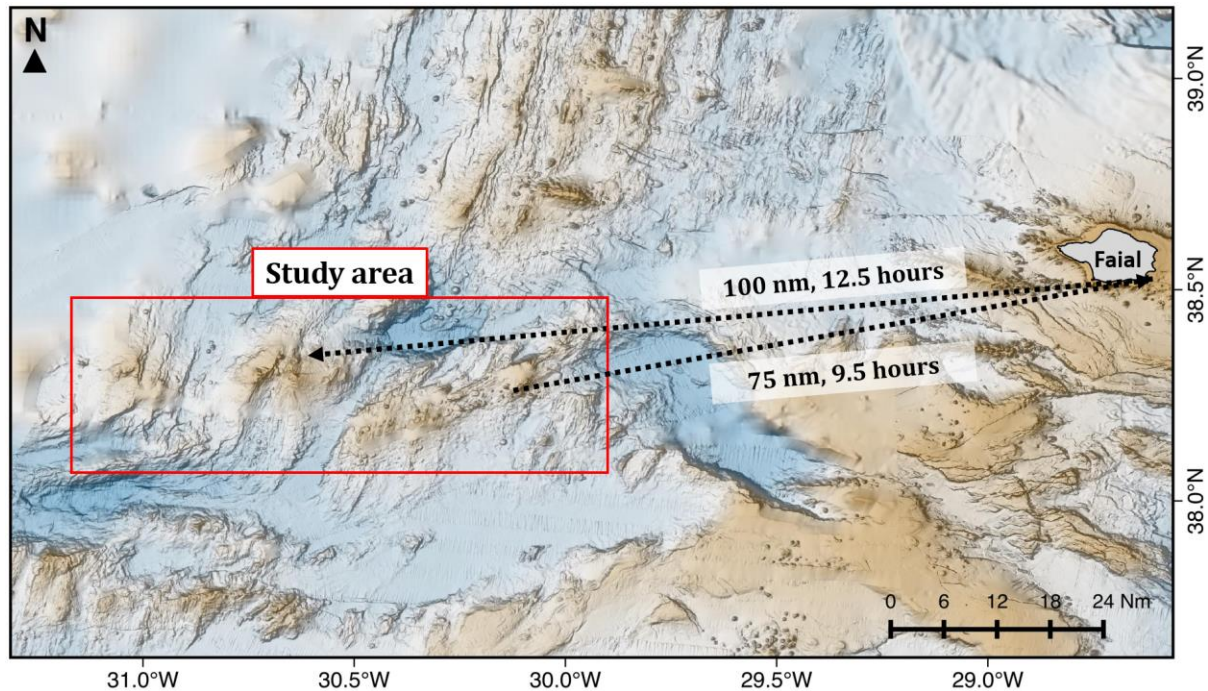


Figure 1. Suggested study area around Cavala seamount area in the Mid Atlantic Ridge.

2. Cruise summary

During the Greenpeace 2019 cruise to the Cavala, Ferradura, Beta and A6 ridge complex, we had the opportunity to conduct short ROVs dives in the Beta and Cavala seamounts. Due to several problems in the ROV, the bottom time was quite limited to about 1:40 hours in Beta and 00:50 hours in Cavala. Also, the distance covered was very small and we were only able to sample a limited area in and the valley between the two peaks of the Cavala seamount.

Beta seamount revealed sparse occurrences of large bubble gum coral (*Paragorgia* cf. *johnsoni*), and a new type of sponge aggregations composed of more than 20 Rossellidae (cf. *Asconema*) individuals per 12m² of field of view. In Beta seamount, as in many other areas of the Mid Atlantic Ridge, diverse multispecies coral gardens were observed. In Cavala seamount, we confirmed the presence of aggregations of the bubble gum coral *Paragorgia johnsoni*, however its extent and densities were impossible to verify. Cavala also revealed a very diverse cold-water coral garden composed of large colonies of *Paramuricea* sp1. with *Paragorgia johnsoni*, and *P. arborea*, and several species of soft corals, including many *Anthomastus* sp. We also observed a diverse sponge field composed of some massive sponges (*Characella pachastrelloides*, *Phakelia robusta*) and *Poecillastra compressa* and many encrusting sponges.

In summary, these two seamounts seem to host very diverse benthic communities of cold-water corals and sponges. Large colonies bubble gum coral were observed in both seamounts suggesting that the distribution of this Vulnerable Marine Ecosystem indicator taxa may be more widespread than previous though.

3. Cruise diary

29/06/2019: Test ROV dive in Capelinhos and transit to Beta

Departure from Horta harbour on-board MV Esperanza at 06:30 to Capelinhos area (Figure 2). Most of the day was used by the ROV and surveyor teams to perform ROV test dives (GreenP_2019_ROV_D01_st001) and to calibrate the positioning system. We left Capelinhos area in direction of Beta seamount at around 16:00.



Figure 2. MV Esperanza in the Horta harbour (left) and the brand new Greenpeace scientific lab ready to be used (right).

30/06/2019: Beta seamount

Arrival at Beta seamount at around 7:00. Due to the weather conditions, the ROV dive was postponed to 9:00, then 12:00, then 14:00, before being finally cancelled for the day. We gave multiple interviews to the media on board the vessel and did a photo session for the Greenpeace media team (Figure 3).



Figure 3. Talking to the media on-board MV Esperanza (left) while waiting for another ROV (right) dive.

01/07/2019: Beta seamount

We decided to stay in Beta seamount because this area haven't been sampled before. The ROV dive (GreenP_2019_ROV_D02_st002) started at 8:26 and was aborted at 09:10 due to mechanical failures. During this short dive we could observe some *Viminella flagellum* and *Anthomastus* sp. on sedimentary rocky substrate. The ROV team changed one of the propellers and a second dive (GreenP_2019_ROV_D03_st003) was started at around 12:30. Problems in the positioning system delay the start of the transect and only a few random observations were done. During this period, we observed one large colony of *Paragorgia* cf. *johnsoni* (Figure 4) and small colonies of the pink bubble gum coral (cf. *Paragorgia arborea* but most likely *Paragorgia johnsoni*), the solitary yellow scleractinian *Leptopsammia formosa*, plexaurids, the pink and white *Swiftia* spp., the anthipatharians *Parantipathes hironelle* and *Stichopathes gravieri*, and the gorgonian *Acanthogorgia* spp. We also observed a few black spot seabreams (*Pagellus bogaraveo*) and macrouridae fish. The surveyor and the ROV

team tried to solve the problems until 17:00 but with no success. The ROV stayed in we decided to do point sampling in areas 100m apart. The vessel moved 100m away from the initial position and the ROV explored that area in a radius of about 20m. After that, we moved another 100m and explored the next area until another mechanical failure forced the dive to be aborted at around 18:00. During the second part of GreenP_2019_ROV_D03_st003, we observed a large area covered with digitate sponges, with some massive sponges (*Characella pachastrelloides*) and *Poecillastra compressa*. In this area we observed some *Hoplostethus mediterraneus* fish close to the seabed. At about 600m depth, we observed a large sponge aggregation (Figure 4) composed of more than 20 Rossellidae (cf. *Asconema*) individuals per 12m² of field of view (our guess). The ROV dive was cancelled at around 18:00 after another mechanical failure.



Figure 4. Some of the communities observed in Beta seamount. One large colony of *Paragorgia* cf. *johnsoni* (left) and a sponge aggregation composed of Rossellidae (cf. *Asconema*).

02/07/2019: Cavala seamount

We arrived at Cavala seamount during the night and started the ROV dive (GreenP_2019_ROV_D04_st004) at around 10:00 in the valley between the main two peaks of the seamount. The ROV reached the bottom at 560m by 10:27 but couldn't conduct a transect line because the ship couldn't keep position and was dragging the ROV. Instead we randomly explored the area to describe the benthic communities in this seamount. The first community observed on the rocky bottom was characterised by a diverse sponge field composed of some massive sponges (*Characella pachastrelloides*, *Phakelia robusta*) and *Poecillastra compressa* and many incrusting sponges. Large colonies of *Paramuricea* sp1. were then observed with *Paragorgia johnsoni* colonies and several species of soft corals (Neftidae), including many *Anthomastus* sp. At 570m many colonies of cf. *Pleurocoralium johnsoni* spread all over rocky bottom together with *Sticopathes* sp., *Parantipathes hirondelle*, and incrusting sponges such as cf. *Hymedesmia*. During this dive we saw one wreckfish (*Polyprion americanus*), bluemouth rockfish (*Helicolenus dactylopterus*) and macrourids (cf. *Nezumia aequalis*). This short dive was cancelled at 11:15 at around 600m depth due to another mechanical failure. At around 19:00 we dove (GreenP_2019_ROV_D05_st005) to the *Paragorgia* garden identified during the DIVANAUT cruise by F. Tempera. The dive started at 620m depth with large colonies of *Paragorgia* cf. *johnsoni* and *Paragorgia* cf. *arborea*, along with sponges mostly of the species *Phakelia robusta*, *Poecillastra compressa*, *Pachastrella monilifera*, and Rosellidae. We also observed many colonies of *Pleurocoralium johnsoni*, *Anthomastus* sp.,



Figure. One of the most characteristic communities observed in the valley between the peaks of the Cavala seamount was composed of large colonies of *Paramuricea* sp1., *Paragorgia johnsoni*, and several species of soft corals (Nefitidae), including many *Anthomastus* sp. (left). Some large colonies of *Paragorgia* cf. *johnsoni* and *Paragorgia* cf. *arborea* were also observed in the valley.

03/07/2019: A6 seamount

We arrived at A6 seamount during the night and planned to start a ROV dive at around 08:30. More technical failures cancelled all the plans and the scientific mission was ended. We started steaming back to Horta harbour at around 09:30.

IMAR UAz associated deep-sea research projects

This cruise builds strong links with the ongoing Horizon 2020 projects ATLAS – A Trans-Atlantic Assessment and deep-water ecosystem-based spatial management plan for Europe (grant agreement No 678760) and SPONGES - Deep-sea Sponge Grounds Ecosystems of the North Atlantic (grant agreement No 679849), and the ongoing PO Açores 2020 projects MapGES - Mapping deep-sea biodiversity and “Good Environmental Status” in the Azores (ACORES-01-0145-FEDER-00056) and LIXAZ - Impacts of Marine Litter in Azores (ACORES-01-0145-FEDER-00053). These two projects will provide the scientific team for conducting the field surveys and will guarantee the analyses of the data acquired to benefit of both Greenpeace and the projects objectives. These projects will also guarantee the dissemination of the results to the wide scientific audience.