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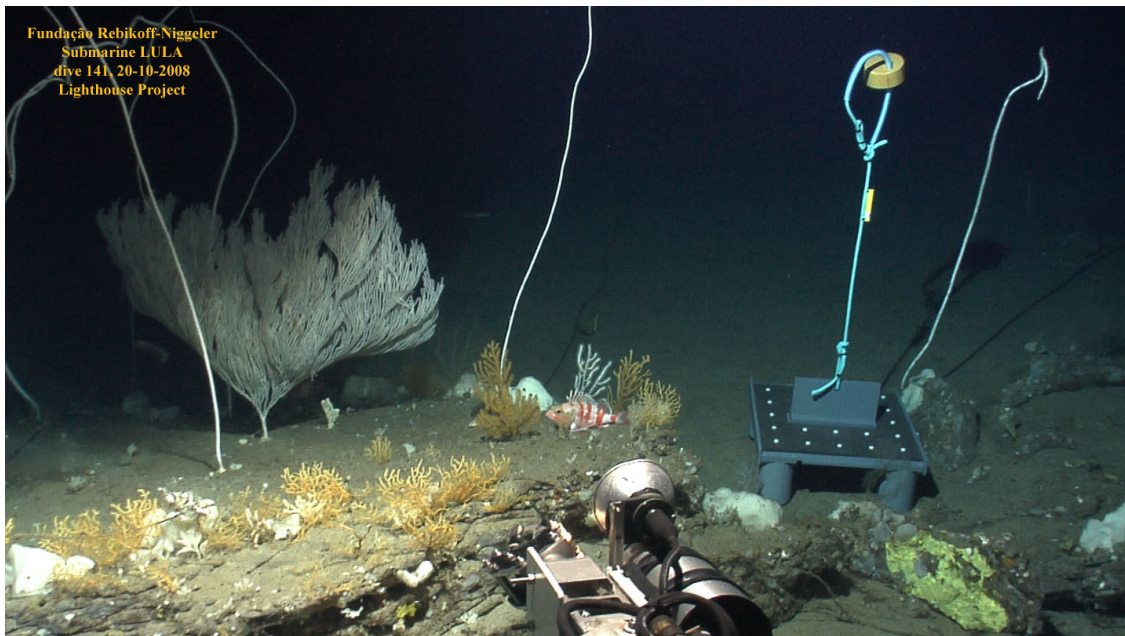
**Azores Deep-Water Ecosystems Study: Final Report 2011**

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Completion of this project was made possible by reallocation of project expedition funds as detailed in the 2010 report and below.

### **1. Completion of video analyses**

*Requested:* Analysis of video survey data from the *Lula* was significantly more difficult due to the nature of the transects and deviation from previously established and agreed survey protocol during diving (lack of navigation data and laser scaling). Reallocation of funds was requested to complete this work. 1-2 peer-reviewed publications anticipated.

*Completion:* This portion of the Lighthouse work will be presented at the CoralFISH/Deepfishman conference scheduled to be held in Galway: 27-31 Aug 2012. A special issue publication will be compiled from this meeting for publication in either Deep Sea Research or Marine Ecology Progress Series. A rapid publication process is anticipated in this way.

### **2. Completion of identification of genetic markers.**

*Requested:* Reallocation of funds was requested so that DNA extracted from two species, *Acanthogorgia armata* and *Funiculina quadrangularis* could be subjected to shotgun sequencing and microsatellite marker identification. 1 publication anticipated.

*Completion:* Existing gorgonian microsatellite markers have been tested and further candidate polymorphic markers for *Acanthogorgia armata* and *Funiculina quadrangularis*. have now been identified using the 454 sequencing protocol (shotgun sequencing ) as specified. Sequencing of two additional octocoral species collected during the Lighthouse project (*Viminella sp* and *Paracalyptophora sp*) in this way has also been undertaken. Bioinformatic analysis of this extended dataset progresses and one student is engaged full time in this work. Costs for sequencing were met by the EU Coralfish Project.

### **3. Completion of phylogenetic analyses**

*Requested:* Reallocation of funds was requested for the completion of molecular phylogenetic work and species descriptions arising from the project. 1 publication and the provision of data for at least one further publication anticipated.

*Completion:* DNA sequencing for the mitochondrial region ND2 is complete for all specimens collected prior to 2011. A provisional phylogeny is presented in Figure 1. In 2011 a further 150 samples (100 *Narella sp*, 20 *Acanthogorgia sp*, and others) were collected. These are being processed and will be incorporated into a final phylogeny. A visual summary of specimen collection locations is presented in Figure 2.

Figure 1 – Provisional maximum parsimony strict consensus phylogeny for octocoral specimens using the ND2 region.

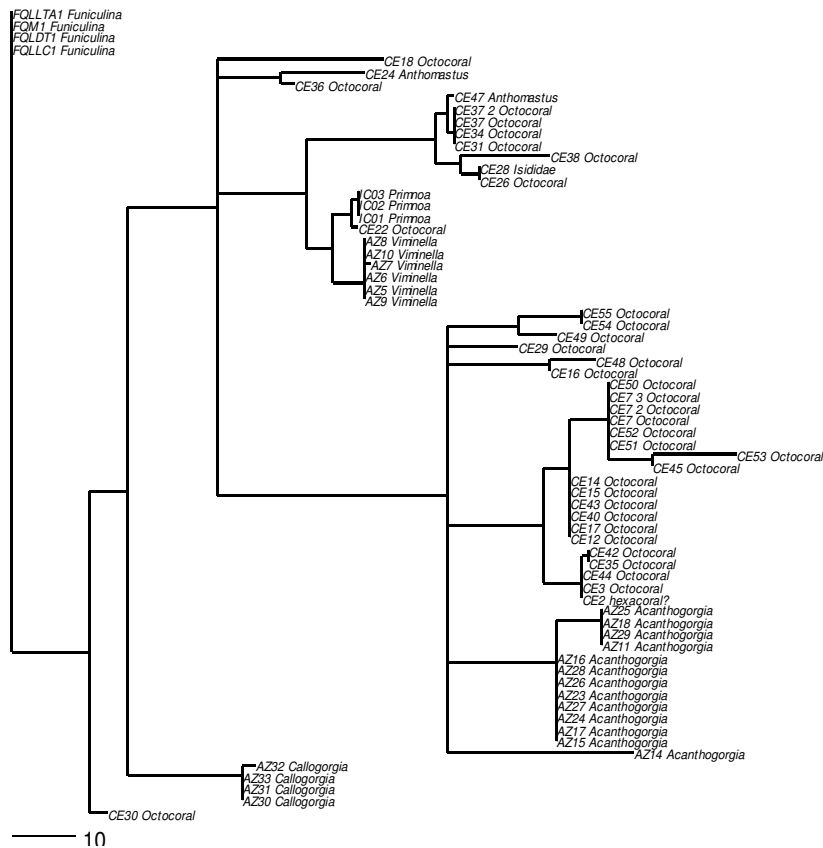
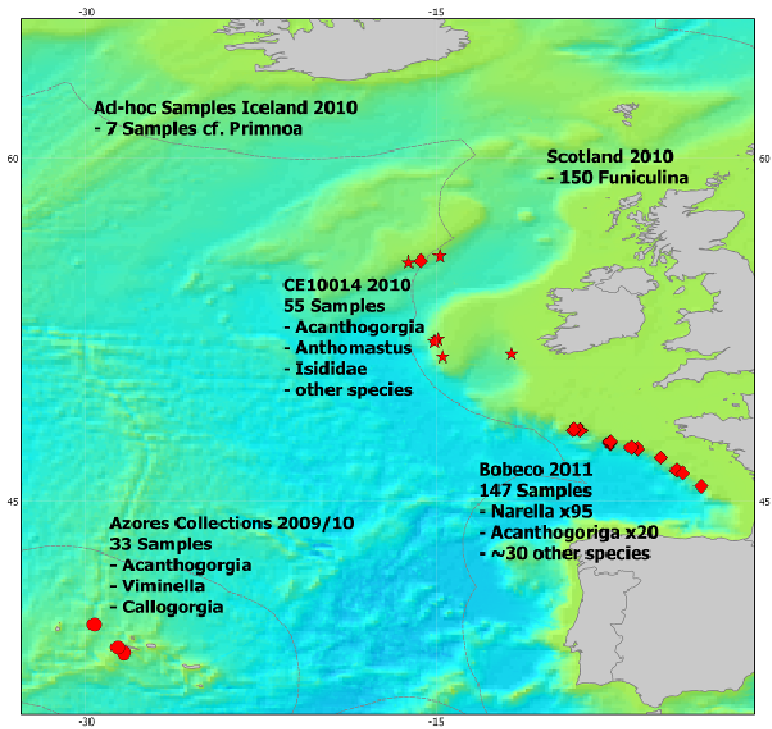


Figure 2 – Visual summary of octocoral specimen collection locations



#### 4. Retrieval of settlement panels

*Requested:* It was stated that we would continue to attempt to retrieve the settlement panels in the Azores after the termination of our working relationship with Fundação Rebikoff-Niggeler. Funds were not requested for this; Coralfish funds were to be utilised if an ROV or submersible, and opportunity to use it, became available.

*Completion:* A successful application was made for time aboard EUROFLEETS cruise (RV L'Atalante, IFREMER) which took place in the Azores region in September 2011. A proposal to undertake two 1.5km ROV surveys on seamount/knoll peaks (40-60km) north of Faial, collection further specimens of *Acanthogorgia*, *Viminella* and *Paracalyptrophora* from survey locations, and to recover the 8 settlement panels remaining in the region, was successful and we were awarded 3 berths and 1.5 days of shiptime. A commercial ROV (Seabotix) with deep enough diving capability was sourced, contracted and transported to Horta for this expedition. This proposal is outlined in Appendix 1. This recovery attempt was ultimately not successful due to breakages in the fibre optic line of the ROV umbilical early in the expedition, which rendered the vehicle unoperable. The EUROFLEETS award of EUR 16,500, in addition to GBP38,335 sourced from the EU project CoralFISH was used to hire and transport the ROV and to undertake the cruise. The panels remain on the seafloor of the Faial-Pico channel, and we await further opportunity to recover them.

#### 5. Communication

It was stated that we would develop a webpage detailing our work on North Atlantic corals for education purposes together with the Lighthouse Foundation. We will not undertake this in association with Fundação Rebikoff-Niggeler and therefore may encounter some difficulty in using footage and imagery collected using the Lula submersible. However this could be undertaken using other footage we have collected in the North Atlantic, and could also include spectacular footage from farther afield (ie new footage currently being collected in the Indian Ocean), and we would like to discuss this directly with the Lighthouse foundation now.

#### 6. Forthcoming papers

- Rogers AD, Taylor ML, Kemp KM, Yesson C, Davies AJ. (accepted) The diseases of deepwater corals. In Downs C (Ed.) Diseases of Corals. CRC Press, London / New York. In press. 97pp (ms) + Figs.
- Moura CJ<sup>†</sup>, Cunha MR, Porteiro FM, Rogers AR (accepted by zoological scripta) Cryptic biodiversity, phylogeographical and evolutionary patterns of shallow and deep-water *Nemertesia* (Cnidaria: Hydrozoa, Plumulariidae) from the north-eastern Atlantic and western Mediterranean.
- Kemp KM, Girling L, Morris K, Rogers AD (in preparation) The association of motile and sessile fauna with substrate type in cold water coral garden ecosystems of the Azores archipelago.
- Kemp KM, Yesson C, Arnaud-Haond S, Rogers AD (in preparation) Isolation and characterization of microsatellite markers in Octocorallia: *Funiculina quadrangularis* *Acanthogorgia armata*, *Paracalyptrophora* sp and *Viminella* sp.