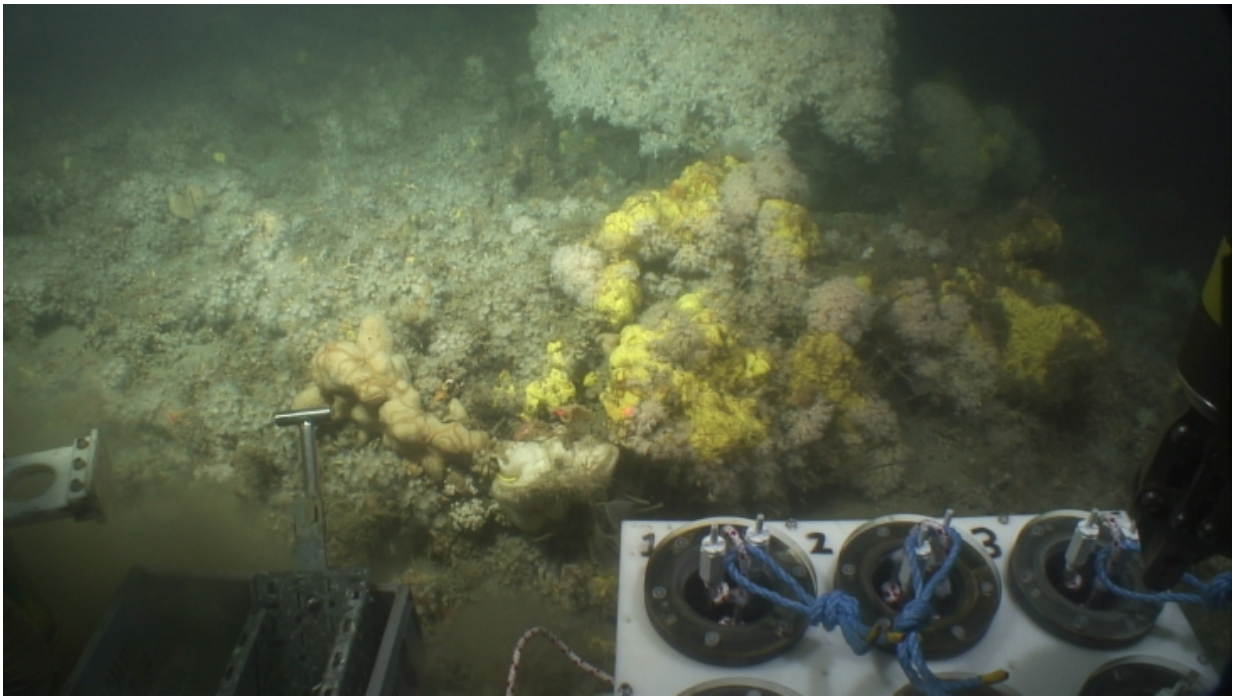
Role of sponges in cold-water coral reefs investigated

July 27 2016



Astonishing sponges, Lophelia corals and diverse associated fauna in Mingulay reef complex (north-east Atlantic). Credit: Changing Oceans Expedition –RRS James Cook 073

Researchers from the University of Aberdeen have discovered that Spongosorites coralliophaga, which is a large sponge (a creature which attaches itself to something solid in a place where it can, hopefully, receive enough food to grow) plays an important role in providing a

structure for the settlement of other organisms in the North-east Atlantic.

The team investigated the sponges in cold-water coral reefs with an aim to unravel the role of these fascinating organisms in the functioning of pristine deep-sea ecosystems

In contrast to tropical coral reefs, which are often met in shallow and warm waters, cold-water coral reefs thrive in deep sea regions under conditions characterized by low temperature, absence of light and limited food resources. Despite these challenging conditions cold-water coral reefs not only host hundreds of species but also have been characterized as hot-spots of biodiversity - like the tropical rain forests.

In the cold-water coral reefs of the north-east Atlantic hundreds of sponge species have been recorded showing a remarkable diversity of shapes, colours and sizes. The team specifically wanted to find out whether sponges play an important role in the structure and functioning of cold-water coral reefs, for example do they host species-rich faunal communities as it has been shown for several shallow-water sponge species? They also wanted to look at if they play a central role in the food web of cold-water coral reefs as was recently revealed for tropical coral reefs.

Dr Georgios Kazanidis and Professor Ursula Witte from the University of Aberdeen in collaboration with colleagues from the Heriot-Watt University investigated for the first time the organisms living attached to the massive sponge Spongosorites coralliophaga in cold-water coral reefs in the north-east Atlantic. Their study, published earlier this year in the journal *Coral Reefs*, revealed that this sponge hosts a species-rich community acting as a settlement surface for many different species.

Furthermore, the Aberdeen team in collaboration with researchers from

the Royal Netherlands Institute for Sea Research have investigated the feeding of Spongosorites coralliophaga and its epifauna on various food sources aiming to provide an insight on the role of sponges in food-web functioning and especially on carbon and nitrogen cycling in cold-water coral reefs.

Samples were collected by the remotely operated vehicle (ROV) Holland I during the "Changing Oceans" expedition on board the Royal Research Ship James Cook in May/June 2012. Back in the laboratory, sponges and their epifauna were identified, counted, weighed and data were used in numerical analyses.

Dr Georgios Kazanidis said: "We have carried out a multidimensional approach on sponges and their epifauna studying biodiversity, trophic structure and feeding; all these have enabled us to unravel intriguing aspects about sponges and their role in cold-water coral reefs. This information is necessary for applying an efficient conservation strategy for these precious and fragile deep-sea ecosystems".

Professor Ursula Witte, senior author of the study, added: "The deep ocean presents society with a major challenge, namely how to protect, manage and responsibly benefit from environments about which we know virtually nothing. Cold-water coral reefs are ecosystems of outstanding beauty as well as biodiversity. This research, highlighting the importance of not just corals but also sponges in structuring the reef, will help scientists and managers to understand how they function, and thus, how best to protect them."

Provided by University of Aberdeen