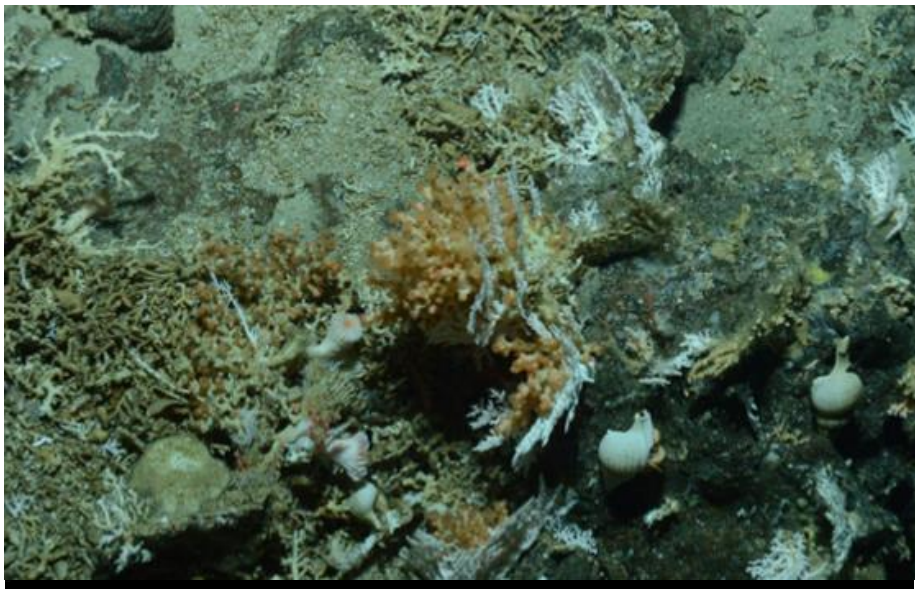


Stony coral Goniocorella dumosa attached to rocky substrate, Chatham Rise

The resilience of deep-sea benthic communities to the effects of sedimentation

Tēnā tātou katoa, whakatōrea te pūtaiao, kia kimihia ai e te rangahau tika!

BY LEE RAUHINA-AUGUST, MALCOLM CLARK, DI TRACEY

21 JUNE 2021

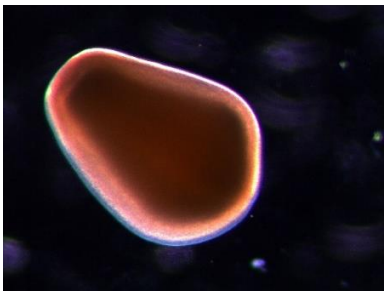
Ngā mihi mahana ki a koutou

Here we present a second snapshot of emerging research results from the ROBES programme. We describe a chance find that leads to new information on coral reproduction.

Live sponges and corals were returned from sea to the NIWA Marine Environment Manipulation Facility (MEMF) for experimental exposure to a range of suspended sediment concentrations and frequencies over time. This is to assess how resilient will these animals be to sediment plumes?

While measuring respiration rates on the corals, scientist Dr Vonda Cummings observed small orange flecks in a respiration chamber. These flecks turned out to be free-swimming larvae (or planulae) about 1mm in size that had been released from the mature coral polyps.

***Goniocorella dumosa* coral colony in the respiration chamber in the MEMF**



Swimming larva of *Goniocorella dumosa* stony coral observed in the aquarium tanks

Little is known of the reproductive traits and dispersal potential of deep-sea corals and spawning events have only been observed for a handful of stony corals globally. This was the first observation of a spawning event for any deep-sea coral in New Zealand waters.

NIWA scientist Dr Jennifer Beaumont examining and photographing the larvae under the microscope

The larvae were under observation for several weeks and further investigation showed that this species is a brooder, with up to 10 mature larvae found in single mature polyps that develop before being released. Previous studies had indicated that *G. dumosa* were broadcast spawners, releasing large numbers of gametes which become swimming larvae once fertilised. These larvae disperse on ocean currents before settling from the water column and attaching to a suitable substratum. Brooders release larger but fewer larvae which are thought to stay closer to their parent host than the larvae of broadcast spawners.

Image of a newly settled larva attached to a dead branch of and adult coral colony *Goniocorella dumosa*. The skeleton has been laid down, the pink tissue (coenenchyme) is forming on the outside of the corallite or cup, and the tentacles are extended out from the polyp mouth

The settling took place within a few days which is a contrast to other deep-sea corals, some of which can take months to reach this stage. It was fascinating to watch and record their development as they form feeding tentacles and a calcified base.

This serendipitous science has greatly increased our knowledge of the life history of this deep-sea species. That these corals are now known to be brooders may mean they have a more limited dispersal than species which broadcast spawn. This could have implications for their recovery potential from human activities and therefore their management.

Kia whiria te mātauranga o te moana

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