



World: Mid-Atlantic Ridge Exploration Reveals Mysteries of the Deep posted on 08/18/04

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This species of deep-sea anglerfish was photographed at depth by an ROV. It is named after the pole-like appendage used to lure its prey.

Photo: MAR-ECO

An international consortium of scientists has released findings from their study of the Mid-Atlantic Ridge (MAR), located in the depths of the Atlantic Ocean between the Azores and Iceland. The so-called **MAR-ECO expedition** offers many new discoveries and insights into deep-sea marine life.

The two-month expedition involved 60 researchers from 16 nations, and is part of an unprecedented ten-year, \$1 billion project called the **Census of Marine Life**.

Using a variety of technologies ranging from remotely operated vehicles (ROVs) to trawl nets, the researchers collected over 80,000 specimens of marine life from up to four kilometres (2.5 miles) below the ocean's surface. In total, 13 species new to the North Atlantic were discovered, and 44 species were found that have been recorded only five or fewer times.

"Each time we splashed into the sea with an ROV we encountered wondrous and apparently undescribed animals that behave in unexpected ways," said expedition scientist Marsh Youngbluth.

Discoveries from the depths

At 2000 metres below sea level, on an underwater mountain called a seamount, deep-sea cameras observed unusual sediment tracks called bioturbation, believed to be the work of bottom-dwelling animals. Some forms of bioturbation are known, but others are not. While the researchers speculated that a large crustacean or a blind lobster may have made the tracks, the greatest mystery is not who made them, but how and why.

Another oddity occurred when scientists encountered two specimens of a rare fish called *Aphyonus gelatinous* in a bottom trawl sample. Caught only once before, these fish dwell on the ocean floor and exhibit a semi-transparent gelatinous covering and underdeveloped eyesight.

According to expedition scientist Ingvar Byrkjedal, the members of this fish family are viviparous, which means they give birth to young rather than laying eggs as most fish do. Practically nothing else is known about their biology.

The collection of 300 fish species included numerous squid, octopus and plankton species that literally came to light for the first time. Two squid species, or cephalopods, offer particular scientific value.

The first cephalopod belongs to a family known to scientists as Promachoteuthidae, of which only eleven known specimens have been extracted from depths below 1000 metres. The unnamed specimen has a small head and small eyes that are covered with semi-opaque "pseudocornea" of unknown function.

The second squid from the MAR-ECO expedition is a sub-adult in excellent condition, especially the delicate and unusual head formation. It appears to be a new species of the genus *Planctoteuthis*.

Researchers also picked up an anglerfish that, based upon the form of its head and luring appendage, appears to be a new species. The anglerfish uses its luring appendage, known as an "esca," to attract its prey. Variations in the shape of the esca also help scientists differentiate between species of anglerfish.

Cold-water corals

Another excellent research opportunity derived from the MAR-ECO expedition was the ability to view the deep-sea coral *Lophelia pertusa*, using still cameras and video recorders mounted on ROV's. *Lophelia* reefs offer a habitat for a variety of deep-sea marine life to thrive, such as sea lilies, sea stars, sea urchins, sponges and many others.

Lophelia is a reef-building coral that lives at depths of 200 to 2000 metres below the surface. Because researchers have seldom had the opportunity for direct, live observation, its biology is relatively unknown. *Lophelia* corals are currently being identified for protection in many countries around the world, **including Canada**.

Researchers were reminded that nothing is wasted in nature, even at depths of 2000 metres where dead coral structures continue to provide shelter for many sea creatures. Furthermore, they discovered that as the structures crumbled into collections of pebbles over hundreds and thousands of years, deep-sea life continues to thrive among the ruins.

In addition to the wonders of nature, the MAR-ECO scientists also observed the impact of human beings at all levels of the ocean, recording evidence of lost fishing gear and an abundance of garbage. These images serve as tangible reminders of our responsibility as individuals to keep the oceans clean by participating in shoreline cleanup activities such as the **Great Canadian Shoreline Cleanup**, from September 11-19, 2004.

The largest collection of undiscovered life on earth thrives in the depths explored by the MAR-ECO team - and beyond. In fact, biologists estimate that between 500,000 and 100 million marine species have yet to be discovered. Furthermore, the researchers hope that the information collected over the next several years will provide better insight into effective fisheries management, and help to ensure a healthy future for our oceans.

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Source: Vancouver Aquarium Marine Science Centre

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