

<http://news.nationalgeographic.com/news/2008/05/080520-brittle-star.html>

National Geographic News: NATIONALGEOGRAPHIC.COM/NEWS

"Brittle Star City" Found on Antarctic Seamount

Dave Hansford in Wellington, New Zealand
for National Geographic News
May 20, 2008



A teeming horde of brittle stars has been discovered atop an undersea mountain chain near Antarctica, challenging long-held assumptions about the ecological role of such submerged peaks, known as seamounts.

The find, nicknamed "Brittle Star City," was made by a team surveying waters near the Macquarie Ridge, 870 miles (1,400 kilometers) south of New Zealand, as part of the Census of Marine Life, a ten-year scientific study of life in the oceans.

(Related photos: "Ocean Life Survey Reveals World of Deep-Sea Creatures" [May 2006].)

Voyage leader Ashley Rowden said the researchers were amazed as images from towed cameras revealed tens of millions of brittle stars—invertebrates related to starfish and sea urchins—feeding in the fierce currents that swirl around Antarctica.

The brittle stars occupied the very summit of the seamount, "the first occurrence, we believe, of this observation," said Rowden, a deep-sea ecologist at New Zealand's National Institute of Water and Atmospheric Research.

Normally communities of corals and sponges crown seamounts, Rowden said, but a unique combination of conditions somehow favored brittle stars in this range.

"This is a shallow seamount—it only comes up to 90 meters [295 feet]—and some species of corals and sponges ... wouldn't be able to survive at that shallow depth," Rowden said.

That left an empty niche, "which can be dominated by another filter feeder," he added.

Fast Food

Rowden said the area's relatively brisk 2.4-mile-an-hour (4-kilometer-an-hour) current—a result of being squeezed between adjacent seamounts—probably provides the brittle stars an abundant supply of food.

"The amount of food in the water may be just the same as anywhere else, but the fact that it's delivered at such a high rate is going to be the key factor," he pointed out.

Peter Batson, a marine biologist at New Zealand's University of Otago, said colonies of "bed forming" brittle stars have been found in other parts of the world, including U.K. and Japanese waters, though never on a seamount.

"These brittle star beds are typically found in relatively shallow areas swept by swift currents—exactly the situation in the energetic waters atop the Macquarie Ridge seamount where Brittle Star City was found," Batson said.

Two species of brittle star have been provisionally identified in the horde. One occurs around New Zealand, while the other is found almost worldwide.

Hot Spots or Not?

The find challenges prior assumptions about seamounts, which have long been considered "hot spots" of marine biodiversity containing communities of creatures unique to particular chains or even single peaks, Rowden pointed out.

"It makes us question generalizations about the uniqueness of seamounts," he said.

"Dense aggregations of brittle stars have been seen elsewhere, so you've got to start thinking, How different are seamounts in general?"

"I think we are beginning to deconstruct the very simple paradigms which were erected in the 1980s and 1990s and starting to erect new ones, which are a little more subtle," he added.

However, if full analysis reveals that the brittle star population is genetically distinct, "there is a very strong argument for their protection," he said.

Bottom trawling—the use of weighted, seafloor-dragging fishing nets—for deepwater species such as orange roughy has been shown to damage seamount ecosystems. While some parts of the Macquarie Ridge are closed to trawling, Brittle Star City is not.

Rowden added that his team hopes to establish how the distribution of deepwater species changes along the Macquarie Ridge "and whether we can relate that to such features as the circumpolar current—whether it acts as a boundary between north and south dispersal for various organisms."

According to the University of Otago's Batson, the discovery demonstrates how little scientists actually know about the oceans.

"The Brittle Star City discovery is another graphic reminder that the ocean is still largely unexplored," Batson said. "Only a few hundred of the estimated 30,000 to 100,000 seamounts have been studied in any detail.

"We can only speculate on what resides on the 99 percent of seamounts that have yet to be looked at. For all we know, there are Brittle Star Cities all over the world," he added.

"Then again, the one on the Macquarie Ridge may be unique. Either way, a habitat as vigorous and spectacular as Brittle Star City is well worth treasuring and protecting."

© 1996–2008 National Geographic Society. All rights reserved.