

By Gabrielle deGroot Redford

Why Should We Care About Marine Worms?

KRISTIAN FAUCHALD IS IN A RACE against time. A curator of invertebrate zoology at the Smithsonian Institution's National Museum of Natural History, he is one of only about 200 people in the world who study polychaetes, the marine worms that inhabit just about every square inch of ocean bottom. The problem is that, up to this point,

scientists have described only about 15,000 of the estimated 45,000 species of polychaetes found throughout the planet. Fauchald is concerned that many species are becoming extinct before researchers can identify them.

Why should we care? For one thing, the scientist points out, polychaetes have existed for eons; Fauchald and his colleagues have been able to trace some groups of worms back 450 or 500 million years. The creatures live throughout the ocean realm, from sand at the edge of the surf to depths thousands of feet below the surface. But most importantly, he says, polychaetes may play a vital role in climate control by helping to reduce carbon dioxide in the atmosphere.

On the ocean floor, polychaetes help convert organic debris into carbon dioxide, which is transported to the surface dissolved in water. Marine plant plankton take up the carbon dioxide and through photosynthesis produce sugars, or food, releasing oxygen in the process. Without this cycle in the ocean (or on land), elevated carbon dioxide levels in the atmosphere would have long since burned up Earth's protective ozone layer. "That link is maintained by a whole lot of organisms, but the polychaetes do play an important role," Fauchald says.

The marine worms may also play a key role in other ecosystem functions, which is why the extinction of unidentified species is worrisome. Fauchald compares it to a theatrical production, in which backup players are waiting in the wings to take over in case something happens to the main actors. "If you consider the food pyramid, it functions so long as you have a satisfactory number of players at each level," he

says. "In coral reefs, as well as in the Arctic and Antarctic, you will not see that a link is missing until one of the levels has run out of players."

Fauchald and his associates at the museum currently are in the process of preparing a large-scale database to help people all over the world identify the polychaetes they find—and hopefully

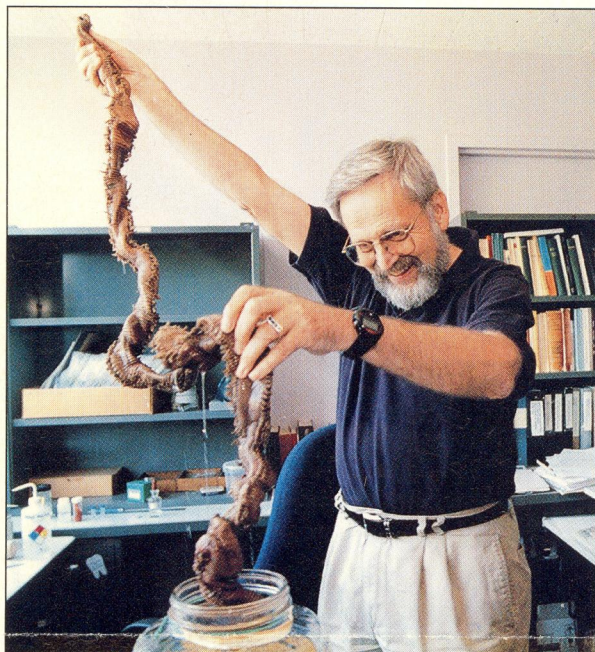
across the globe instructing other scientists about marine worms or teaching them in his lab in Washington, D.C. He also continues to do fieldwork, mostly at Smithsonian research stations.

Those locations are far different from those in Fauchald's native Norway, where he first came in contact with polychaetes. When Fauchald was 14 his family lived in the tiny city of Tromsø and he began working after school at a museum there. One day, the director suggested that the teenager pursue studying polychaetes because the museum had thousands of specimens that had that no one had yet been identified.

Since then, Fauchald estimates he has described 200 new species himself, many of which are housed in the Smithsonian's vast natural history collection. Only a tiny fraction of those specimens are actually on display. The others are warehoused in cavernous rooms, located along a labyrinth of hallways hidden from public view. The polychaete room houses 1.5 million specimens.

"Cute little guys, aren't they?" Fauchald jests as a visitor grimaces

at one particularly menacing specimen. Ranging in length from a tenth of a millimeter to more than 200 feet, polychaetes are opportunistic; they have been known to consume blood and eat each other. "They will feed on anything that doesn't move too fast and isn't too aggressive," he says. "And if all else fails, they will eat the sediment." That adaptability, adds the researcher, will hopefully enable some species to survive for another 500 million years.



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DEEP-SEA TREASURE: In his Smithsonian Institution office, Kristian Fauchald pulls an eight-foot coral sea worm out of a specimen jar. The scientist has devoted his life to identifying the many worms that inhabit almost every inch of ocean bottom.

recognize when they've stumbled upon a new species. "Right now what we get in is a lot of common species," he says of the 2,000 specimens that come across his desk every year.

As the only curator of polychaetes at the Smithsonian, Fauchald spends months every year either traveling

Maryland writer Gabrielle deGroot Redford has gained a new appreciation for marine worms.