



**BRITISH COLUMBIA: Canadian Scientists to Tag and Track 'Fossil' Fish** posted on 11/16/04

By Geoffrey Gluckman, AquaNews Correspondent



Dr. Sylvia Earle pilots 'Deepworker' in the Vancouver Aquarium's Wild Coast exhibit, demonstrating the sub's maneuverability while visitors and media watched.

Photo: Andy Torr

VANCOUVER - Dr. Tony Ribbink has traveled halfway around the world in his search for experts to help him study one of the ocean's most enigmatic fish: the coelacanth.

Dr. Ribbink, the Programme Manager for the **African Coelacanth Ecosystem Programme** (ACEP), visited the Vancouver Aquarium yesterday to meet with Canadian scientists and discuss his plans to track the so-called 'fossil fish' using special radio tags.

Once believed to be extinct, coelacanth inhabit deep-water canyons in the West Indian Ocean, such as those off the coast of Ribbink's native South Africa. Their biology and range are not well understood, but Ribbink hopes to change this by enlisting the help of Dr. Scott McKinley, an expert in aquatic telemetry at the University of British Columbia, and Dr. Phil Nuytten, a pioneer in deep-water exploration and founder of **Nuytco Research Ltd.**

With their expertise, Ribbink hopes to tag and track live coelacanth in South African waters, in an effort to better understand their behaviour in their natural setting.

"If we aspire for excellence, then we must get the best in the world to produce excellence," said Ribbink, as he presided over a Vancouver Aquarium-hosted demonstration of Deepworker, a submersible developed by the Vancouver-based Nuytco Research and piloted by world-renowned oceanographer Dr. Sylvia Earle.

[Click here](#) to watch a short video clip.

### 'Old Four Legs'

Thought to be extinct for some 60 million years, the 1938 discovery of a coelacanth specimen in a South African fish market astonished the scientific world. Despite their recent rediscovery, however, little is known about these fleshy, cave-dwelling, lobe-finned creatures.

Coelacanth (*Latimeria chalumnae*) have virtually the same anatomy as their prehistoric ancestors, *Actinista*, which thrived 400 million years ago. Known as 'old four legs' due to their four limb-like fins – two pectoral and two pelvic – coelacanth move in a similar fashion to the human walk, with opposite arm and leg swing, leading scientists to suspect that coelacanth may represent a transitional species between ocean- and land-based vertebrates. This cross-pattern motion also indicates the presence of a mid-brain, a feature not often found in aquatic animals.

Since 1987, researchers have made repeated submersible dives to study these mysterious fish in known habitats such as the steep, rocky slopes of the Comoros Islands, where they exist at depths of around 150 metres. The Comoran coelacanth population was estimated at 500 individuals.

Ten years later, two coelacanth were caught off the north coast of Indonesia, nearly 10,000 kilometres from the Comoros Islands. Based on genetic analysis, scientists estimate the Comoran and Indonesian coelacanths separated one million years ago, fuelling hope of finding more pocket populations elsewhere. That hope was fulfilled in 2000, when single specimens were found off the coasts of Mozambique, southwest Madagascar, Tanzania and Kenya. Still others were observed by scuba divers in a canyon in South Africa's Sodwana Bay.

### Probing the Depths

Further research into the mysteries of the coelacanth and its environment offers scientists a "window into the past," notes Ribbink, whose current project aims to peer through this window at tagged specimens 24 hours a day.

Since the coelacanth is a sub-tidal species existing at 60-400 metres below the surface, a deep-sea craft is an obvious necessity for this type of study—and Nuytco's Deepworker is perfectly suited to such endeavors.

The single-seated sub will allow ACEP scientists to locate, observe and ultimately tag coelacanth. Equipped with lights, cameras and a robotic arm, Deepworker is slightly smaller than a Volkswagen Bug and able to descend to over 600 metres (2000 feet). The submersible maintains a cabin pressure of one atmosphere (the same as sea level), enabling its operator to work for up to eight hours without requiring decompression, a laborious process that commercial divers routinely endure after long periods underwater.



An unlikely evolutionary survivor, coelacanth have been secretly dwelling in the deep-water canyons of the Indian Ocean for millions of years.

Photo: Juergen Schauer/

**JAGO-Team,  
Max-Planck-Institute, Seewiesen**

A remotely operated vehicle (ROV) launched and controlled from Deepworker will attach an acoustic tag to several coelacanth, enabling Dr. McKinley and his team to more effectively monitor each fish and its environment. In addition to the tags, data receivers and hydrophones (underwater microphones) will be placed in the surrounding area to transmit the information by satellite to researchers at the surface.

The collected data will reveal the movements of the tagged fish as well as the surrounding topography, water composition, current flow and salinities—all critical to enhancing scientists' understanding of coelacanth and their habitat. Scientists also hope to discover which other species co-habit these ecosystems with their coelacanth neighbours.

### Coelacanth Conservation and Education

Since ACEP's launch in 2002, a number of unique revelations about the world's oceans have come to light, helping scientists to improve their efforts in conserving and sustaining biodiversity.

With coelacanth as its icon animal, ACEP draws together twenty-five disciplines including marine geoscience, marine biology, oceanography and genetics to create an unprecedented integrated knowledge base of the unexplored Western Indian Ocean.

ACEP makes this information public through environmental programs such as shipboard cruises for children. Dr. Ribbink noted that the proliferation of the Internet has also been tremendously helpful in furthering the programme's educational goals by allowing people around the world near-instant access to new information. "We are creating 'virtual institutions'

by bringing together the best scientists from around the world," he said.

Over the next five years of this study, Ribbink hopes to garner enough knowledge to solve the evolutionary enigma that is the coelacanth. This information will only add to our growing knowledge of another larger and relatively unknown frontier: the world's oceans.



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*His espionage novel, Deadly Exchange, is forthcoming.*

Source: Vancouver Aquarium Marine Science Centre

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