

[Nasa](#) probes B.C. lake; Canadian, U.S. scientists search waters of Cariboo lake, which holds potential clues to life on Mars

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Abstract (summary)

"All of a sudden it was life on Mars and all this kind of stuff," said Pemberton, who is vice-president of the Artificial Reef Society of B.C. "I said, 'What are you guys talking about?'" The structures found by Pemberton and the Pescaderos were, in fact, calcium carbonate, but also contained single-celled microbes, which makes the structures different from lifeless stalactites or stalagmites found in caves. Years after the Pescaderos divers' find, the official "discovery" of microbialites at Pavilion Lake was announced in a paper in the journal *Nature*, in October 2000, based on the exploratory work of Harry Bohm, then of the underwater research lab at Simon Fraser University, and John Pollack, a Nelson-based surveyor and Explorers Club member affiliated with the Underwater Archaeological Society of B.C.



Full Text

Long before scientists and astronauts from NASA and the Canadian Space Agency descended on the B.C. Cariboo in search of microbialites - a potential clue to life on Mars - there were Doug Pemberton and the Vancouver Pescaderos Dive Club.

It was a hot day in the mid-1980s when Pemberton and his club were driving home from a dive with the migrating sockeye at Adams Lake.

"It was stinkin' hot and we thought, 'Let's go for a swim somewhere.' We pulled over and jumped in the water."

They'd picked Pavilion Lake, midway between Cache Creek and Lillooet, and soon discovered something strange in the water.

One member said, "Hey, there's coral growing here."

"What are you talking about?" Pemberton recalled saying.

"No, really, there's coral." They returned to their vehicle, got out their scuba gear and went for a dive to a depth of close to 20 metres.

"Holy crap, it looked like brain coral," Pemberton concluded.

He said the club took some samples and sent them to the University of B.C. "to a freshwater biologist or something" for identification, but got back a rather deflating letter. "He seemed to think that they were just calcium carbonate. So we left it at that."

Several years later, all that changed. The scientific community realized there was, indeed, something very important about those formations in Pavilion Lake.

"All of a sudden it was life on Mars and all this kind of stuff," said Pemberton, who is vice-president of the Artificial Reef Society of B.C. "I said, 'What are you guys talking about?'" The structures found by Pemberton and the Pescaderos were, in fact, calcium carbonate, but also contained single-celled microbes, which makes the structures different from lifeless stalactites or stalagmites found in caves.

Microbialites represent some of the earliest remnants of life on Earth, common 540 million to 2.5 billion years ago.

Today, they are found in environments often too harsh for most organisms, which makes those at Pavilion Lake, as well as Kelly Lake - 20 kilometres to the northwest, and the current focus of scientific research starting this week - so interesting.

Years after the Pescaderos divers' find, the official "discovery" of microbialites at Pavilion Lake was announced in a paper in the journal *Nature*, in October 2000, based on the exploratory work of Harry Bohm, then of the underwater research lab at Simon Fraser University, and John Pollack, a Nelson-based surveyor and Explorers Club member affiliated with the Underwater Archaeological Society of B.C.

"Pavilion is a classic case of a major discovery hiding in plain sight for decades," said Pollack.

NASA and several academic institutions in the U.S. and Canada participated in that paper and the official identification of the microbialites.

"I guess it just depends how curious you are to follow up on something," offered Darlene Lim, a NASA research scientist specializing in freshwater systems. "It really is an interesting story of exploration."

When Lim joined NASA in 2004, she was tasked with revisiting Pavilion Lake. Researchers scoured all lakes within a 30-kilometre radius of Pavilion Lake that year but could only confirm more microbialites at Kelly Lake.

With funding from NASA and the Canadian Space Agency, scientists conducted research at Pavilion Lake from 2008 to 2010, using two submersibles to go where scuba divers could not. Pavilion Lake is 65 metres deep and located at an elevation of more than 800 metres, factors that impose limitations on divers.

Starting this week at Kelly Lake, a 15-minute drive west of Clinton, scientists are continuing their research into whether microbes or chemical reactions are responsible for creating the coral-like

structures. One possibility, Lim explains, is that cyanobacteria that obtain their energy through photosynthesis are responsible by "forcing out the precipitation of calcium carbonate."

Studies of the structures so far suggest evidence of biological influence on the surface, "but as you go lower, deeper into the structures, that biosignature disappears. It's still outstanding what the dominant mechanism was that created these structures over time."

The research has direct relevance to the potential discovery of microbialites in space, including asteroids en route to Mars - and whether they could hold evidence of life.

"Where did these microbialites come from, what's their interaction with time, the role with groundwater, all kinds of questions," said U.S. astronaut Mike Gernhardt, who is making his fourth visit to B.C.'s Cariboo - the same number of times he's been in space. "On one dive I found a huge microbialite, totally inconsistent with what people thought the growth rates could be and the age of the lake. It had been nucleated on this huge rock. It was 30 feet long and 25 feet high, and looked like a big bunch of bananas."

He added: "There's all these lakes in the world, why these ones with microbialites? There's only a few places in the world where they've found them, and here they're just abundant."

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Credit: Larry Pynn; Vancouver Sun

Illustration

Donnie Reid, Special To The Vancouver Sun / Scientists scour Pavilion Lake for microbialites, single-celled microbes that are among the earliest remnants of life on Earth.;; Caption:

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