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# B.C. scientist to analyze space radiation effects on worms returning from space

Published: Friday, June 15, 2007 | 10:49 AM ET

Canadian Press: CAMILLE BAINS

VANCOUVER (CP) - About 100,000 worms, each smaller than the width of a grain of salt, will be making their way back from space next week as part of a six-month experiment aboard the International Space Station.

Simon Fraser University scientist Bob Johnsen can hardly wait to analyze what's happened to them since they've been gone.

"I'm very excited," said Johnsen, who will be heading to Cape Canaveral in Florida to collect the worms that have returned on the Space Shuttle Discovery.

Johnsen isn't the only one who's excited. A Grade 6 science class in Mississauga, Ont., has also been viewing pictures of the worms from outer space, getting beyond the initial "Ew, worms" stage.

Johnsen is studying the effects of space radiation on the tiny creatures for the benefit of astronauts venturing off on lengthy trips to the moon and Mars in the near future.

The research associate in the university's department of molecular biology and biochemistry said Wednesday the worms (*C. elegans*) have about a two-week lifespan on Earth and will have produced about 28 generations in space.

He wants to study the mutations in the worms - the damage to their DNA from space radiation - over those generations to try to get an understanding of how the information could be applied to humans.

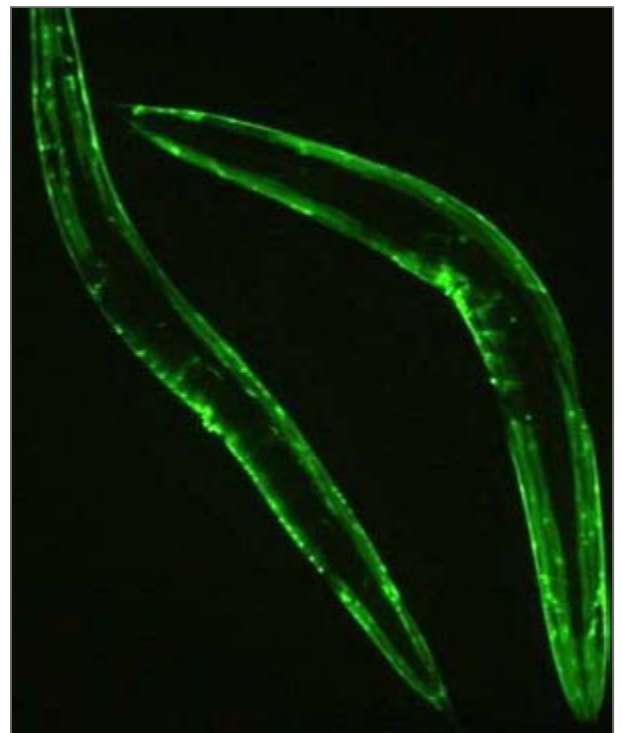
That's because the worms that are barely visible to the human eye have about 20,000 genes, the same number as people and about half of them perform similar functions.

"When you're on the space station you can measure radiation with physical detectors but you really don't know what the biological effects are on people that are staying on the space station for long periods of time," Johnsen said.

"We want to get some understanding of the types of damages that space radiation causes and hope that we'll be able to start working on some countermeasures to protect our astronauts when they're going on these longer missions."

NASA scientists want to learn about the impact of space radiation before sending a crew to Mars by 2035.

According to current research, one in eight travellers on a round trip to Mars could die from radiation poisoning and



About 100,000 worms, each smaller than the width of a grain of salt, shown in this magnified handout photo will be making their way back from space next week as part of a six-month experiment aboard the International Space Station. (CP PHOTO/Simon Fraser University-HO)

the rest would likely become seriously ill.

While the International Space Station has been inhabited by humans and other organisms since 2000, none has been up there to produce several generations until the worms got on board last Dec. 8.

Two other space experiments involving different types of the *C. elegans* worm have been done, but they only lasted for eight and 11 days, not the six months that Johnsen's work entails to provide information on the long-term impact of radiation exposure.

During their journey to space, the worms are being housed in a specialized incubator, through which they are automatically fed and where they are reproducing.

The incubator, developed by a company headquartered at the University of Colorado, includes a camera that's capturing photos and video of the worms during their extended visit to space.

The photos are being analyzed by kindergarten to Grade 12 students in the United States, who are participating through an Internet-based educational group called Orion's Quest.

Darcel Avenue Senior Public School in Mississauga, Ont., an elementary school, is the only one in Canada that's participating in the project.

Grade 6 science teacher Cathy Haskett-Morrison said she got her class involved after a trip last February to the NASA space educators' conference in Houston, Tex.

She said the students have been viewing photos of the worms from among 550 posted on the web after learning about space travel and some who were initially reluctant about the "yucky" worms have shown a lot of interest in the space program.

"My kids didn't particularly have a strong science program and it's really piqued their curiosity," Haskett-Morrison said.

"It's piqued my kids' attention so much this year that they already want to know what next year's program is. So I've already agreed that we'll go into the next (space) mission that's happening in the fall."

The University of Pittsburgh's department of biological sciences and the Malaysian Space Agency are also involved in the worms-in-space experiment.

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