Device detects fish-killing viruses

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Ben Forward says it's not only prudent to take proactive measures against potential fish-killing viruses - it's necessary.

ENLARGE PHOTO

Readying fish tissue samples: Ben Forward, department head of food fisheries and aquaculture at the Research and Productivity Council (RPC), readies fish tissue samples to be tested for viruses.

"For the most part it's not a matter of if they'll become a problem, but when," said the department head of food fisheries and aquaculture at the Research and Productivity Council (RPC) of emerging strains like the salmon alpha virus which could have a 30 to 40 per cent mortality rate for the species if allowed to flourish.

That's why Forward is testing tissue samples from kidneys and other internal fish organs to ensure potential outbreaks aren't imminent for clients at fish hatcheries across Atlantic Canada.

The device he uses to detect those viruses is called a real time polymerase chain reaction (PCR) machine - a simple, rectangular machine that looks more like a printer than the new lynchpin of aquaculture safety. Samples are placed in a tray of tiny tubes which are slid in a slot in the front of the machine.

Once the samples are inside, the PCR begins a series of temperature change cycles that activate enzymes and molecules called primers. These in turn amplify target DNA/RNA sequences specific for the virus of interest. Each temperature cycle doubles the amount of target DNA/RNA in the sample, making it abundant enough to be detected by the instrumentation. The primers are encoded to specifically amplify only the virus gene. When this specific targeted virus sequence begins to build in the PCR reaction another DNA sequence, tagged with a fluorescent dye called a probe, binds specifically to its target. It then gives off a deep fluorescent glow, which is detected by the instrument.

"It gives us a better idea of how prevalent the virus might be in the area where the sample is from," Forward said. "It's an indication of whether or not we should be worried."

Forward said the test can help hatcheries determine if a virus is plaguing one of their tanks, so they can know in time to drain it and dispose of the affected fish before the affliction spreads.

He said that could save them thousands of dollars, the majority of their fish, and an abundance of time.

"It can not only save them a lot of money, it can prevent the loss of fish," he said. "Not just current fish, but future ones because they'll know to thoroughly clean that tank."

He said if the virus is found in a sample from a body of water, given to them from the Department of Environment, the authorities can be alerted in time, removing tainted fish before it causes a pandemic.

The PCR helps RPC service clients from across Atlantic Canada, and countries like Chile, where such viruses are a growing problem. Forward said such a catastrophe is far from imminent in New Brunswick - and that's why the test is there in the first place.

"It's a way to ensure our fish are safe, and to keep them that way," he said.

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