



## Norwegian virus devastating to farmed salmon spreads to Canada and Chile: paper published

*Piscine reovirus previously reported only in the Atlantic Ocean*

**(Sointula, BC, July 16, 2013)** The first scientific publication on the occurrence of piscine reovirus outside of Norway was published on July 11 in *Virology Journal*. The report, *Whole-genome analysis of piscine reovirus (PRV) shows PRV represents a new genus in family Reoviridae and its genome segment S1 sequences group it into two separate sub-genotypes*, was co-published by researchers from the Atlantic Veterinary College at the University of Prince Edward Island, Centro de Investigaciones Biológicas Aplicadas in Chile, and the Raincoast Research Society in British Columbia.

Piscine reovirus (PRV) was identified in 2010 as the causative agent of heart and skeletal muscle inflammation (HSMI) in Norway. This disease, first recognized in Atlantic salmon farms in Norway in 1999, is a condition that weakens salmon, making it difficult for their hearts to pump blood. HSMI is spreading rapidly in Norway. Marine Harvest, who grows one-fifth of the world's farm-raised salmon, lists HSMI as the second largest cause of death of their fish in their 2012 Annual General Report.

In this paper, the co-authors show that piscine reovirus is in British Columbia and it came from Norway. The process of tracing viruses is similar to matching fingerprints. Scientists around the world enter viral sequence data into GenBank so matches can be run. The piscine reovirus found in British Columbia is most similar to a Norwegian PRV sequence from Atlantic farmed salmon suffering from HSMI in the Lofoten Archipelago in northern Norway. The paper also reports PRV is now in Chile and it most closely matched a Norwegian PRV sequence from the Trondheim region.

The newly published paper reports piscine reovirus entered British Columbia from Norway in 2007 ± 1 year and Chile in 2008 ± 1 year. The piscine reovirus sequences included in the paper were from farmed Atlantic salmon bought in Vancouver supermarkets, wild cutthroat trout from Cultus Lake, chum salmon from near Campbell River, farmed steelhead from Lois Lake and farmed Atlantic salmon morfs from the central coast of British Columbia. The Chilean samples were all Atlantic farmed salmon.

Experts in Norway continue to publish papers on the relationship between PRV and the disease HSMI. With over 400 Norwegian salmon farms now infected with PRV there are warnings in their papers:

*“measures must be taken to control PRV not only because it threatens domestic salmon production but also due to the potential for transmission to wild salmon populations.”*

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2901333>

In ongoing work, Morton and Kibenge have found PRV in nearly 97% of the farmed salmon tested from B.C. supermarkets.

The Province of British Columbia does not accept that PRV causes HSMI. There is no published research supporting the province's theory.

"The evidence suggests PRV recently arrived from Norway, which means we have not experienced its full potential to kill B.C. wild salmon yet," says co-author Alexandra Morton, "but when the experts warn us that PRV should not be allowed to spread because of its threat to wild salmon, I don't know why we would ignore them. This research has shown most farmed Atlantic salmon in B.C. supermarkets are infected with PRV. This suggests the millions of farm salmon still out in the net pens are also infected, which means the wild salmon swimming home this summer will be exposed to this Norwegian virus. It is extremely poor management to allow a Norwegian salmon virus to infect our wild salmon."

The only containment of PRV possible would be to cull infected farmed salmon and to end the practice of using net pens to raise Atlantic salmon on wild salmon migration routes. This would be a significant risk to the viability of the 98% Norwegian-owned industry operating in British Columbia.

The co-authors recommend that PRV-HSMI be treated as an emerging disease. The Department of Fisheries and Oceans (DFO) and the Canadian Food Inspection Agency (CFIA) do not test for PRV. Norwegian scientist, Dr. Are Nylund, University of Bergen, recommends measures to remove PRV-positive Atlantic salmon from net pens in the ocean to prevent spread of this Atlantic virus into the Pacific.

"The viability of wild salmon has been put at risk in favor of the viability of farmed salmon," notes Morton.

Last month the World Health Organization for Animal Health (OIE) stripped the Kibenge Lab of its international authority as a reference lab for a different European virus, called ISAv. They have declined to give a reason.

Morton has taken the Minister of Fisheries and Marine Harvest to court with the assistance of Ecojustice. Morton seeks to have the Fisheries Act upheld and not allow transfer of salmon into net pens carrying known disease agents into B.C. marine waters.

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**The electronic version of this article can be found online at:**

<http://www.virologyj.com/content/10/1/230>

**B-roll video clips for media & a short video on the story of PRV in BC can be downloaded here:**

<http://www.salmonconfidential.ca/piscine-reovirus>