

## New virus may pose risk to wild salmon

July 9 2010

Farmed fish are an increasingly important food source, with a global harvest now at 110 million tons and growing at more than 8 percent a year. But epidemics of infectious disease threaten this vital industry, including one of its most popular products: farmed Atlantic salmon. Perhaps even more worrisome: these infections can spread to wild fish coming in close proximity to marine pens and fish escaping from them.

Heart and skeletal muscle inflammation (HSMI), an often fatal disease, was first detected in salmon on a farm in Norway in 1999, and has now been reported in 417 fish farms in Norway as well as in the United Kingdom. The disease destroys heart and muscle tissue and kills up to 20 percent of infected fish. Although studies have indicated an infectious basis, recent efforts to identify the pathogen causing the disease have been unsuccessful. Now, using cutting-edge molecular techniques, an international team led by W. Ian Lipkin, MD, the John Snow Professor of Epidemiology and director of the Center for Infection and Immunity at Columbia University's Mailman School of Public Health, has found evidence that the disease may be caused by a previously unknown virus. The newly identified virus is related but distinct from previously known reoviruses, which are double-stranded RNA viruses that infect a wide range of vertebrates.

The full study findings are published online in the publication PLoS One.

"Our data provide compelling evidence that HSMI is associated with infection with a new reovirus," says Gustavo Palacios, first author of the study and assistant professor of Epidemiology in the Center.



"While there is no evidence that this could spread to humans, it is a threat to aquaculture and it has the potential to spread to wild salmon," added Dr. Lipkin.

To identify the virus, the Columbia University investigators used 454 high throughput DNA sequencing and bioinformatics, including a new tool called Frequency Analysis of Sequence Data (FASD), pioneered by Raul Rabadan of Columbia's Department of Biomedical Informatics. Investigators in Norway and the U.S. then looked for viral sequences in heart and kidney samples from 29 salmon representing three different HSMI outbreaks and 10 samples from healthy farmed fish. Twenty-eight of the 29 (96.5%) known HSMI samples and none of the 10 healthy salmon samples were positive. The investigators also tested 66 samples obtained from <u>wild salmon</u> living in nine coastal rivers in Norway. The virus was detected in sixteen of these samples (24.2%), though generally in lower concentrations than found in ailing farmed fish.

"The speed of this process, and the enthusiasm on both sides of the Atlantic created a very fruitful collaboration," says Espen Rimstad, a professor at the Norwegian School of Veterinary Science in Oslo. "Using the expertise of our colleagues at Columbia in high throughput sequencing and advanced bioinformatics, we had within a few weeks the whole genome sequence of a hitherto unknown virus."

Additional research will be needed to confirm that the reovirus is the cause of HSMI. Meanwhile work has already begun in Norway to develop a vaccine to protect farmed <u>Atlantic salmon</u>.

Provided by Columbia University

Citation: New virus may pose risk to wild salmon (2010, July 9) retrieved 28 April 2024 from <u>https://phys.org/news/2010-07-virus-pose-wild-salmon.html</u>



This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.