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# UBC researchers question whether viruses are keeping sea lice at bay in wild salmon

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By Responsible Seafood Advocate

## Viruses may prevent 'explosions' in sea lice populations, offering natural control agent for salmon parasites, researchers say

A new study conducted by University of British Columbia (UBC) researchers could shed greater light on the types of viruses being carried by sea lice, and how the viruses and host are interacting.

Sea lice are parasitic copepods (small crustaceans) found in many fresh and saltwater habitats and have been implicated in the decline of wild salmon populations. The study, which was published in *PLoS Pathogens* (<http://dx.doi.org/10.1371/journal.ppat.1011386>), has identified more than 30 previously unknown RNA viruses in sea lice.

"We found many more types of viruses than are known in sea lice or their distant relatives," said Dr. Curtis Suttle, senior author of the paper and UBC marine microbiologist. "The lice are mounting an immune defense response to many of these viruses indicating that they are replicating."



Viruses may prevent “explosions” in sea lice populations, offering a natural control agent for salmon parasites, according to a UBC study. Sea louse (*Caligus clemensi*). Photo credit: Hakai Institute.

The research team analyzed RNA from three species of sea lice (*Lepeophtheirus salmonis*, *Caligus clemensi* and *Caligus rogercresseyi*) that have a large ecological and economic impact on fish and fisheries. The data were obtained from sea lice removed from out-migrating juvenile salmon collected in the waters surrounding the Discovery Islands and Broughton Archipelago on the northeastern side of Vancouver Island, as well as from farmed salmon in Chile.

A promotional banner for the Responsible Seafood Summit. On the left is the logo for Responsible Seafood Summit, which includes a stylized fish icon. To the right of the logo, the text reads "Responsible Seafood SUMMIT". Further right, the location and dates are listed: "SAINT JOHN NEW BRUNSWICK CANADA OCTOBER 2-5 2023". A prominent red button with the word "REGISTER" in white capital letters is positioned to the right of the text. On the far right, there is a logo for the Global Seafood Alliance and a map of the region with several red airplane icons indicating travel routes.

(<https://events.globalseafood.org/responsible-seafood-summit>).

Sea lice are a big problem for the fish aquaculture industry worldwide due to their proliferation among dense populations of farmed fish. Chemical treatments have failed to solve the problem.

Viruses tend to kill species that flourish, so populations that might otherwise take over an ecosystem are often controlled by viruses. By infecting and weakening their hosts, viruses maintain balance in nature.



## Animal health giants have sea lice in their crosshairs

Alltech and Benchmark have been working on the next generation of sea lice solutions and believe they have new products that can help salmon farmers win.



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“In a natural system, viruses may prevent explosions in sea-lice populations by rapidly replicating when densities become high, and so might form a natural biological control agent for a parasite of salmon,” says Dr. Suttle.

The viruses encompassed all the major groups of RNA viruses, with many likely representing new families and genera. Surprisingly, the closest relatives of some of the newly discovered viruses are only known to infect plants or fungi. According to the researchers, this implies that over evolutionary time, viruses jumped between fungi and arthropods, a group of animals that includes crustaceans such as sea lice and crabs, as well as spiders and insects.

**[Read the full study \(http://dx.doi.org/10.1371/journal.ppat.1011386\)](http://dx.doi.org/10.1371/journal.ppat.1011386)**.

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