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Health & Welfare

Overlooked sea lice structure may hold clues to how parasites infect salmon

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By Responsible Seafood Advocate

Studying how the rostral spike helps sea lice infect salmon could lead to new ways to disrupt attachment and control the parasite

A Nofima researcher is investigating whether a little-studied structure on salmon lice helps the parasites detect and attach to salmon, potentially offering a new target for sea lice control.

The structure, called the rostral spike, is a small projection at the front of the salmon louse during its copepodid stage, when the parasite is free-swimming and searching for a host. Although the structure was briefly described as a “filament duct” in a 1991 scientific paper, its potential role in host detection and attachment has received little attention.

In a recent study published in ***Parasitologia (https://nofima.com/publication/10485477/)***, Nofima fish health researcher Amritha Johny examined the structure using microscopy and electron microscopy. She observed the rostral spike in every salmon louse she examined and found that it appeared to be highly active as the lice sensed, probed and penetrated salmon skin.

A Nofima researcher is studying whether the rostral spike could lead to new ways to prevent sea lice from attaching to salmon. Photo credit: Amritha Johny © Nofima.

“The fact that it moved made me curious, and I wanted to find out what it was,” said Johny.

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Johny studied wild salmon lice collected from farmed salmon as well as laboratory strains. Egg strings were hatched and developed into copepodids at Nofima’s laboratory in Ås before samples underwent further analysis using electron microscopy at the Norwegian University of Life Sciences Imaging Centre.

Microscopy showed that the rostral spike is flexible and moves in coordination with the rest of the louse’s body. It can also extend from or retract into the body shell, and researchers observed a pore-like opening near the point where the spike attaches to the body.

The observations have prompted researchers to investigate whether the structure plays a role in how salmon lice detect and attach to their hosts, although its precise function has not yet been established.

“If the salmon louse’s ability to detect and infect a host depends on specialized structures such as this rostral spike, it may be possible to disrupt the process before the louse has time to attach to its host,” said Johny.

From apps to traps, these innovations offer hope in the battle against sea lice plaguing aquaculture industry

Apps, traps and vaccines are among the innovative solutions for the costly sea lice challenge in salmon aquaculture.

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Johny said further research is needed to determine exactly how the rostral spike functions and whether it could ultimately be targeted as part of new salmon lice control measures.

“There are many ‘mysteries’ to solve about how salmon lice find and interact with their host,” said Nick Robinson, a senior researcher at Nofima who leads **CrispResist (https://nofima.com/projects/crispresist/)**, an international research project investigating the mechanisms underlying differences in sea lice resistance among fish species. “Amritha Johny draws attention to an appendage on the lice that could play an important role.”

Read the full study (https://nofima.com/publication/10485477/).

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