

## Summary

### **Infection success of salmon lice related to temperature and implications for regional size of salmon production areas.**

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#### **Abstract**

The development rate for salmon lice larvae is highly temperature-dependent. Hence, the time from hatching of nauplii to an infectious copepodid will vary with the natural cycles in the sea. The salmon lice life span is prolonged at lower temperatures. This has implications for dispersal of larvae in the environment and the subsequent decision of what is the sensible regional size of salmon farming areas.

The dispersion of salmon lice larvae in Norwegian coastal waters are being studied by means of mathematical hydro dynamic models. To further extend on the model, biological data for the salmon lice are being implemented. The life expectancy for free living larvae at different temperatures will be important to include to model how long the larvae should be considered infective in the water masses.

#### **Material and methods**

The infection success of salmon lice as a function of copepodid age have been studied in controlled systems at temperatures ranging from 6 to 12°C.

Adult salmon lice with egg strings were either collected from salmon hosts kept in sea cages or from salmon in a commercial slaughter house. Egg strings were separated from the female and placed in a temperature controlled hatching unit. Newly hatched salmon lice were collected every day and placed in holding units. Copepodid groups

of specific and different age were used to infect salmon in a temperature controlled system and the successful moult to chalimus on salmon recorded.

## **Results**

The salmon lice were as expected infectious for a longer time at lower temperature. Infection success varied with temperature and age of copepodids. Of the total copepodids introduced in each tank the highest overall infection success was found at 8°C with Day 4 old copepodids (49%). The last possible time for infection is higher at lower temperatures. In the temperature range studied salmon lice larvae had from 16 days to a month to disperse.

## **Discussion and conclusions**

The quality of the copepodids used for infection can clearly vary and have been a topic of discussion in scientific meetings over the years. In this study each group of copepodids will have a different egg string source. From 100 to 300 egg strings will be placed in one hatching unit and a nauplii group have its origin from 10 to 40 egg strings hatched on one particular day. A standardisation of the copepodid quality either behavioural or chemical would be of great value to further studies.

The time span for a successful settlement of salmon lice larvae vary with temperature and are prolonged at lower temperatures. At the lowest temperature studied the last successful settlement was obtained 30 days after hatching.