

Selective mortality of herring larvae subject to delayed swimbladder filling

Study programme: Fisheries biology and Management / Marine biology

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Objective:

To determine if herring larvae subject to delayed swimbladder filling experienced short term or long term elevated size selective mortality.

Background:

As part of a larger effort to evaluate possible effects of petroleum related activities in the Lofoten-Vesterålen area on fisheries resources, we carried out an experiment with herring larvae subject to food oil additions on the water surface (Sundby et al. 2013). This delayed the swimbladder filling of the larvae and simulated the effect of an oil spill without the added effect of toxic substances from crude oil or produce water. The preliminary results suggest that average growth of larvae exposed to the food oil was not negatively affected, but further analyses are needed to evaluate if any size selective mortality took place. Sampled material from exposed and control groups are available and in addition surviving herring juveniles are also available from the Bergen Aquarium for comparative analyses. The results of the investigation will be of relevance and interest to range of stake holders including, the general public, managers of fisheries and environment, as well as the scientific community.

Method:

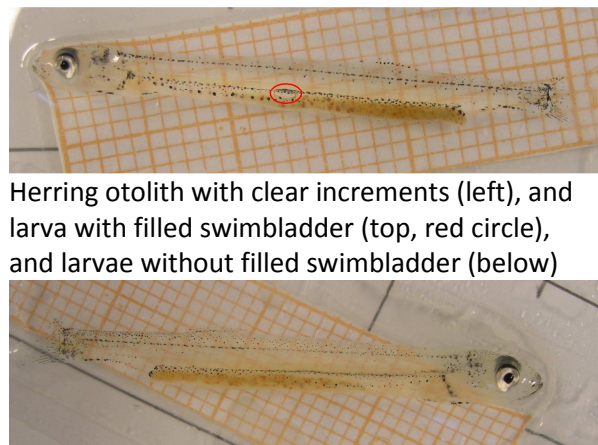
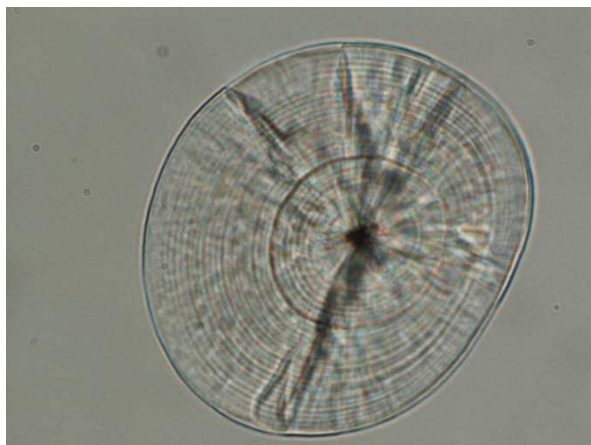
The use otolith microstructure analysis will reveal any systematic differences in growth and mortality patterns between exposed and control groups, and also document if there has been any changes in survivor characteristics over time (Folkvord et al. 2009).

Prerequisites:

An interest in larval fish ecology and interactions between environment, fisheries, and other human activities. The work will involve microscopy, image analysis and basic data exploration and analysis.

References:

- Folkvord, A., Koedijk, R., Lokøy, V. and Imsland, A.K. 2010. Timing and selectivity of mortality in reared Atlantic cod revealed by otolith analysis. *Environmental Biology of Fishes*, 89: 513-519.
- Sundby, S., Fossum, P., Sandvik, A.D., Vikebø, F.B., Aglen, A., Buhl-Mortensen, L., Folkvord, A., et al. 2013. KunnskapsInnhenting Barentshavet – LOfoten – Vesterålen (KILO sluttrapport). *Fisken og Havet*, 00: 1-210.



Herring otolith with clear increments (left), and larva with filled swimbladder (top, red circle), and larvae without filled swimbladder (below)