

Differences between observed growth and a physiological growth index (RNA/DNA ratio) in larval Pacific cod (*Gadus macrocephalus*) at different temperatures

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The ratio of RNA/DNA (R/D) has applications as a growth index in larval fish, and is very sensitive to recent changes in nutritional condition and protein synthesis. A fluorometric protocol (Caldarone *et al.* 2001) was used to obtain nucleic acid levels allowing analyses of whole-body individual larvae. Short-term growth patterns were compared between two groups of larval Pacific cod (*Gadus macrocephalus*) maintained at different temperatures (5°C and 8°C) from hatch. The aim of this study was to understand aspects of the relationship between early growth and temperature in these fish. Fish were sampled immediately after hatch, as well as 23 and 36 days post hatch (dph). Not surprisingly, at both 23 and 36 dph, fish at 5°C had significantly lower growth rates and lengths relative to fish at 8°C. However, an expected similar trend was not in fact observed for R/D ratios between groups. At 36 dph fish at 5°C exhibited significantly higher R/D ratios relative to fish at 8°C. Hence, the expected elevated RNA/DNA ratios were not seen with higher growth. The results suggest a compensatory mechanism to maintain protein synthesis, with higher RNA concentrations and consequently higher R/D levels, due to possibly reduced RNA efficiency at colder temperatures. An extended sampling period will be useful in elucidating long-term physiological effects, if any, on growth of P.cod exposed to cold temperatures.

Student Presentation