

# **Survival of Infectious Salmon Anemia Virus (ISAV) in raw seawater of different temperatures**

Dhamotharan Kannimuthu, HyeongJin Roh, H. Craig Morton, Kai Ove Skaftnesmo, Ma. Michelle D. Peñaranda, Søren Grove

Institute of Marine Research, PO Box 1870 Nordnes, 5870 Bergen, Norway

Infectious salmon anaemia virus (ISAV), a single-stranded enveloped RNA virus of the Orthomyxoviridae family, poses a significant challenge for salmon aquaculture in Norway. Accurately determining ISAV survival times under different seawater conditions is crucial for improving disease-prevention and management strategies. Previous studies have reported that ISAV survival in seawater can range from less than 3 hours to 112 days, depending on the method used to evaluate virus survival. In this current study, we developed a salmon fry challenge model to monitor the decline in ISAV infectivity over time in seawater at different temperatures. Cell line-propagated ISAV was inoculated into 200 mL of raw seawater of 34 ppt held at different temperatures (4, 7, 10, 13, and 17°C) and incubated for time-periods ranging from 4 hours to 10 days. Following incubation, the virus-containing seawater was added to separate tanks containing 200 mL of fresh water with 30 salmon fry each. Fish were bath-challenged with the virus for 4 hours with aeration. After 90-degree days, all fish were sampled, and virus infection was determined using RT-qPCR. The infection prevalence showed an inverse relation with increasing seawater temperature and incubation time. For each temperature, the infection prevalence was plotted against the incubation time, and the data fitted using an exponential decay model. The half-life of ISAV was calculated from the resulting exponential decay curves. An improved estimation of virus survival at different temperatures will help improve the current models for virus spread and be important for infection control and risk management.