

Impacts of single and repeated formalin baths and jellyfish (*Aurelia aurita* and *Cyanea capillata*) exposures on gill pathology in Atlantic salmon (*Salmo salar*).

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Over the past decade, gill pathology and associated complex gill disease (CGD) in farmed Atlantic salmon has become one of the most detrimental causes of mortality and economic loss on the West Coast of Canada and around the world. CGD is estimated to account for the loss of 12,500 tonnes of salmon annually in British Columbia alone. The etiology of CGD is not well defined, and includes a broad range of pathogens, environmental conditions and handling practices. To better understand the progression of CGD, we are developing *in vivo* laboratory models using etiologies identified in past literature including single and repeated exposures to different bath treatments (i.e. formalin and hydrogen peroxide) and jellyfish (*Aurelia aurita* and *Cyanea capillata*). We are also assessing an *in vitro* method of examining jellyfish impacts on Atlantic salmon. The aim of our present work is to determine the histological effects of these etiologies on the gills of Atlantic salmon smolts and how they contribute to the development of different stages of gill disease and potentially CGD. To accomplish this, fish were exposed to treatment baths of formalin for a period of 20 minutes, or baths of jellyfish slurry for a period of 1, 6 or 10 hours. At 6 hours, 24 hours and 7 days post exposure to a respective treatment, fish (n=6-10) from each treatment tank are euthanized and tissue samples collected for analysis. The left, first gill filament was collected for molecular analysis and the second gill arch on the right and left side was collected for histological analysis. The results of this study will be an important contribution to our understanding of CGD in Atlantic salmon, and will serve as an excellent framework for the development of treatment and preventative measures.

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