

Ontario Animal Health Network (OAHN)

Fish Expert Report

July to December 2016, Report #2

Executive Summary

This report is a communication for aquaculture producers in the province of Ontario, compiled by the Ontario Animal Health Network (OAHN) Fish Expert Group. Aquaculture veterinary case load has increased from the winter months heading into spring and summer. To date in 2016, the majority of the fish issues observed have been non-infectious and related to environmental conditions.

Aquatic Veterinary Services Disease Summary

There were a number of diagnoses during the period of July to December 2016 in aquaculture production in Ontario. Diseases diagnosed this term are listed below with commonly observed gross lesions, changes in behaviour as well as common predisposing factors.

Disease	Pathogen	Gross Lesions & Behaviour	Predisposing Factors
PARASITES			
Branchial copepods	<i>Ergasilus</i> sp.	Increased respiratory rate, observe parasite grossly on gills (~2mm), gill necrosis and hemorrhage.	Open water (cage-cultured, pond-raised, wild-caught).
Ichthiobodosis (Costia)	<i>Ichthiobodo</i> sp.	Flashing, darting, rubbing, increased respiratory rate, bluish or whitish film on body.	Recent temperature drop, deterioration in water quality
Ich	<i>Ichthyophthirius multifiliis</i>	Flashing, darting, rubbing, increased respiratory rate, white nodules along the skin and gills (parasite ~ 1mm diameter).	Elevated water temperature (15-25°C), but can occur <10°C, stress, high density.
Trichodinosis	<i>Trichodina</i> sp.	No signs to flashing, coughing.	Deterioration in water quality, especially organic waste.

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Aquatic Veterinary Services Disease Summary (continued)

Disease	Pathogen	Gross Lesions & Behaviour	Predisposing Factors
BACTERIA			
Motile Aeromonas septicemia	<i>Aeromonas hydrophila</i>	Few external or internal signs in peracute cases. Red areas on the body and inside the fish in acute cases. Abscesses and ulcers in chronic cases. Pop-eye, darkened skin and swollen abdomen can also be observed.	High temperature, overcrowding, organic pollution (fecal waste, etc) and low dissolved oxygen.
Furunculosis	<i>Aeromonas salmonicida</i> subsp. <i>salmonicida</i>	Few external or internal signs in peracute cases. Skin ulcers and “furuncles” are uncommon. Red areas on the body, lethargy, pop-eye and swollen abdomen.	Stressors: changes in temperature, handling, water quality and crowding.
Unknown (possible pathogen)	<i>Flavobacterium acquadurense</i>	Unknown	Unknown
Bacterial gill disease (BGD)	<i>Flavobacterium branchiophilum</i>	Decreased appetite, piping, increased gilling rate, coughing very high mortality rate, mortalities often have mouth agape and/or flared opercula, lethargy, and a large amount of mucous can be observed on gills.	Overcrowding, low dissolved oxygen, high ammonia, high turbidity.
Columnaris disease	<i>Flavobacterium columnare</i>	Increased respiratory rate, skin erosion and ulceration, gill and skin lesions with yellow mucoid material.	Elevated water temperature (>15°C), recent stressor, late spring to early fall.
Bacterial cold water disease	<i>Flavobacterium psychrophilum</i>	Few external signs in acute cases (enlarged spleen on necropsy), skin erosion and ulceration.	Lower water temperature (<10°C but can occur at higher temperatures), recent fish movement or stressor, early spring.
Streptococcosis	<i>Streptococcus</i> spp.	Darkened skin, lethargy, pop-eye, red areas on the body, often surrounding vent,	Elevated water temperature, stressors; especially high stocking density.
Vibriosis	<i>Vibrio vulnificus</i>	Red areas on the body, skin ulcers, lethargy, pop-eye, corneal ulcers, swollen abdomen.	Elevated water temperatures, stressors; especially high stocking density and organic waste.
Enteric red mouth disease	<i>Yersinia ruckeri</i>	Dark fish that cannot find food (blind), darkened skin, pop-eye, red areas along the mouth and eyes, lethargy, swollen abdomen.	Strain virulence plays a large factor in severity of disease as well as environmental stressors.

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Provincial Update

In April 2014, responsibility for the Fish Inspection Act & Fish Interim Audit Program was transferred from the Ministry of Natural Resources and Forestry (MNR) to the Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

Since the legislative transfer, OMAFRA has been administering the audit program for approximately 100 non-federally registered fish processors, providing food safety direction, providing advice to non-federally registered fish processors and additional resources about fish inspection in Ontario.

In the fall of 2016, OMAFRA hosted several engagement sessions throughout the province to discuss a proposed regulation for fish under the Food Safety and Quality Act. Eight stakeholder meetings were held as well as additional meetings with government partners and Indigenous communities. The formal consultation period ended in October and the feedback gathered will be considered when finalizing the regulation.

Federal Update

Certification for export to USA of live finfish (salmonids) and their fertilized eggs, and dead unviscerated salmonids and their offal

The US Fish and Wildlife Service (US-FWS) has informed the Canadian Food Inspection Agency (CFIA) of the certification requirements for future exports of live finfish (including salmonid species), germplasm or genetic material for culture, stocking and enhancement and research or dead unviscerated salmonids or parts thereof (including offal) for any end use, from Canada to the US.

Effective immediately, export certification must be provided by US-FWS approved private certifying officials using private laboratories (non-government) for all required diagnostic testing. CFIA is no longer responsible for providing export certification or diagnostic testing services for exports of these commodities to the US.

Whirling disease in Canada

The Canadian Food Inspection Agency (CFIA) has confirmed the presence of Whirling Disease, a federally reportable disease under the *Health of Animals Act*, in the Bow River watershed of Alberta, including Banff National Park. The Bow River watershed has been declared an infected area for this disease and this is the first outbreak of whirling disease in Canada. Whirling disease is an infectious disease of finfish that affects trout and salmon that caused by a microscopic parasite, *Myxobolus cerebralis*.

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Federal Update (continued)

Whirling disease in Canada

The rest of Alberta has been declared as a buffer area for this disease until surveillance by the CFIA, Parks Canada and the Government of Alberta determines that the buffer area or parts of the buffer area are either free or infected with whirling disease through diagnostic testing.

As a result of the new declaration, a domestic movement permit will be required from the CFIA for the movement of susceptible species, the vector *Tubifex tubifex*, the disease causing agent *Myxobolus cerebralis*, and/or related things out of the infected and buffer areas of Alberta.

The following are examples of facilities and activities that will require a permit:

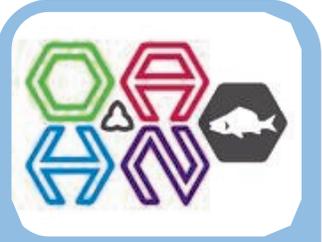
- Provincially-licensed aquaculture facilities in Alberta wanting to move live or dead finfish or gametes for cryopreservation, culture, research, and release into natural waterways.
- Diagnostic laboratories receiving live or fresh dead or frozen finfish, or the pathogen of whirling disease from the Bow River watershed or from Alberta.
- Other types of laboratories that participate in water toxicity or benthic testing programs, for example, and are receiving live or fresh dead or frozen finfish, or freshwater sediments.
- Research activities that utilize live or fresh dead or frozen finfish, the vector of whirling disease, the pathogen of whirling disease, or freshwater sediments from the Bow River watershed or from Alberta.

Affected finfish may exhibit unusual behaviour such as swimming in a whirling pattern and skeletal deformities of the body or head. However, not all infected finfish show signs of disease therefore the diagnosis of whirling disease requires laboratory testing. Whirling disease is a cause of death in the younger life stages of susceptible freshwater finfish and overall deaths of infected fry and fingerlings can reach 90 percent.

Whirling disease is not spread directly between finfish. The parasite is spread through contact between finfish and a freshwater worm. Whirling disease can be spread by moving any of the following:

- infected live or dead finfish,
- infected worms,
- contaminated equipment, or
- contaminated water.

For more information, please go to the [CFIA webpage:
http://www.inspection.gc.ca/animals/aquatic-animals/diseases/reportable/whirling-disease/eng/1336685663723/1336685826959](http://www.inspection.gc.ca/animals/aquatic-animals/diseases/reportable/whirling-disease/eng/1336685663723/1336685826959)



Contact OAHN:

Check us out on the web:

www.oahn.ca

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Ontario Animal Health Network



Email: oahn.fish@uoguelph.ca

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Update on the OAHN Research Project: Antimicrobial Resistance in Ontario Aquaculture

The intent of the project is to gain a baseline understanding of the degree of antimicrobial resistance in common bacterial pathogens in the Ontario aquaculture industry. The importance of acquiring and tracking this type of data over time includes developing disease prevention programs in order to decrease the use of therapeutants in food fish, tracking resistance to therapeutants and adapting treatment protocols.

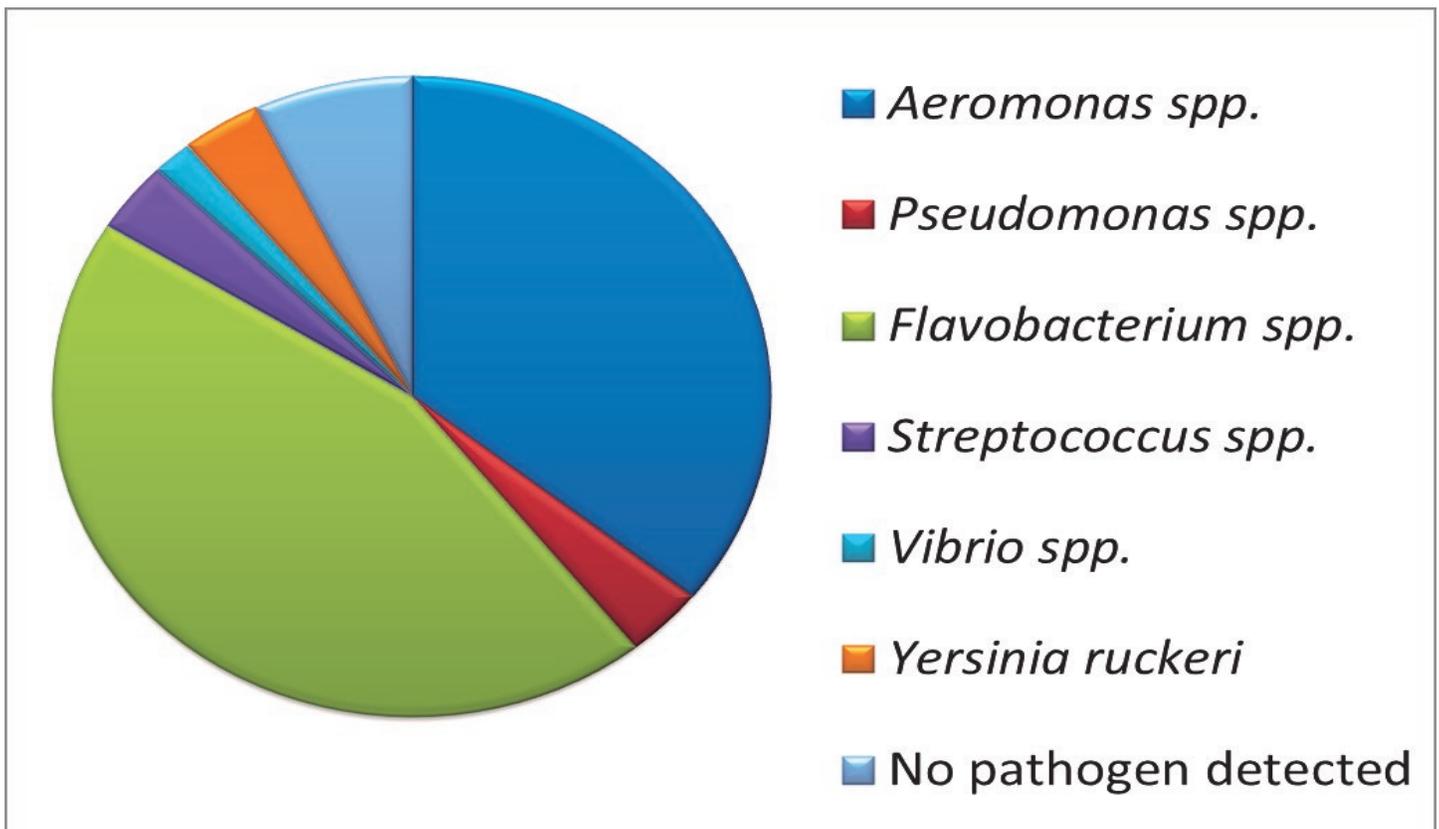


Figure 1. Bacterial pathogens isolated by genus as a percentage of case submissions at the University of Guelph's Animal Health Laboratory.

In 2016, fish specimens that were submitted to the University of Guelph's Animal Health Laboratory as part of regular screening and fish health testing were tested. In total, 28 cases were submitted for bacterial cultures and 24 cases were positive for fish pathogens. Many cases were positive for more than one pathogen and those that were considered primary fish pathogens were further tested for minimum inhibitory concentrations (MICs) to monitor for resistance to antibiotics. MICs are defined as the lowest concentration of an antimicrobial that will inhibit the visible growth of a microorganism after overnight incubation.

Update on the OAHN Research Project: Antimicrobial Resistance in Ontario Aquaculture (continued)

While this work has only recently begun and the sample size is still relatively low, the project has provided some interesting results. The majority of the cases to date have been positive for *Aeromonas* and *Flavobacterium* species. To date, most of the common bacterial pathogens observed in Ontario have not shown resistance to the antibiotics typically used in the treatment of diseases in aquaculture production. However, the results of MIC testing indicate that some of these pathogens are intermediately sensitive or resistant to common treatments like oxytetracycline and florfenicol (Aquaflor). In particular, the bacterial pathogen which causes cold water disease, *Flavobacterium psychrophilum*, demonstrated intermediate sensitivity to florfenicol which may indicate future resistance problems. The causal agent in columnaris disease however, *Flavobacterium columnare*, remains sensitive to treatment by oxytetracycline. These findings demonstrate the importance of routine antimicrobial resistance testing in a facility where there is regular use of antibiotics for a narrow spectrum of diseases.

New in 2017:

To encourage the submission of more specimens from producers and to increase the sample size, OAHN will be subsidizing veterinary services in 2017. Subsidies are available until December 31, 2017 or until the project funds are exhausted, whichever comes first.

What does this mean for producers?

- If you use a veterinarian to submit fish samples for testing, the OAHN project funds will cover 75% of veterinary service & diagnostic fee pricing, in addition to covering 100% of the cost of MIC testing.
- Producers are responsible for covering the cost of 25% of the total bill for veterinary services and diagnostic fee(s), in addition to 100% of costs associated with travel & accommodations for the veterinarian.

How to Qualify:

Establish contact with an Ontario-licensed veterinarian and arrange consultation/sample submission through the veterinarian. Samples must be submitted to the University of Guelph's Animal Health Laboratory.

For more information, please contact us at oahn.fish@uoguelph.ca



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- Province of Ontario
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