Diseases of Cold Water Fishes

Dr. Veronique LePage BSc DVM MSc (Nikki)

[FishDoc, 2000]

Staff training

- Case data collection or history
- Behavioural signs
- Gross lesions
- Wet mounts
- Necropsy techniques
- Proper sampling of tissues
- Treatment (calculations and mixing)

Supplies

- Basic water quality equipment
  - Temperature, pH, ammonia, nitrites, nitrates, chlorine, DO
- Dissection instruments
  - Scissors, scalpel blades and handles, knives, sharpeners, forceps
- Microscope
  - Slides, cover slips, immersion oil
- Digital camera
  - Handheld, microscope
- Sampling

  Whirlpack bags or ziplock bags, coolers, markers and pencils, formalin, 70%+ ethanol, access to ice chips or shaved ice

Case data collection

- Good record keeping (electronic ideal or scanned hard copies)
- Some data that should be recorded daily (T, DO, mort)
- Records sent to vet for 1-2 weeks prior to mortality or sampling event.
- Include:
  - Behavioural signs
  - Gross lesions
  - Daily mortalities
  - Temperature
  - Tank volume or density
  - Biomass
  - Shipping and moving dates
  - Treatments (concentrations, dates, durations)
  - etc

Wet Mounts

- **Skin scrapes**
  - Use a slide or scalpel blade to scrape skin in the direction with the scales
  - Scrape aggressively enough to remove mucous and scales
  - Place drop of water over your sample
  - Add a cover slip, add water until air removed
  - View slide under microscope
- **Gill biopsy**
  - use small scissors to cut the last ~2mm of gill filaments
  - Place on slide
  - Add drop of water
  - Add a cover slip, add water until air removed
  - View slide under microscope

Necropsy

- One or two specially trained staff members
- One day training with follow up
  - Proper description of lesions
  - How to document lesions
  - Which tissues to collect
  - How to preserve and ship samples for various tests

- For example, the following tissues should be collected for submission for histological analysis: 1. fin(s), 2. skin with underlying muscle, 3. kidney, 4. spleen, 5. intestine, 6. pyloric cecae, 7. stomach, 8. liver, 9. heart, 10. eye, 11. gills (multiple gill arches). Brain can be submitted if feasible as well as gonads.

Sampling

- Formalin-fixed tissues and fresh tissues ideally
- Formalin-fixed tissues can be fixed for 24-48 hours and shipped in fluid or removed and shipped in bags wrapped in paper towels soaked in formalin or ethanol.
- Refrigerate fresh tissues, DO NOT freeze
- Place in bags, labelled clearly (tank #, date, etc)
- Ice in cooler for shipping (chips or shaved ice to avoid crushing **OR** use hard plastic containers for samples)
- Parasites whole in ethanol for ID (vial or bag)
- Priority shipping or personal drop-off

Veterinary Support

- Fish Pathology Laboratory
  - Dr. John Lumsden
- Animal Health Laboratory Services
  - Dr. Veronique LePage
  - Large/Food Animal Veterinarians
  - Small Animal Clinicians

Food Animal Health Management

- Veterinary assessment
  - Yearly health assessments
  - Pre-shipment health assessments
- Handling techniques
- Transportation
- Biosecurity
- Animal welfare considerations
- Organic farming
- Notifiable and reportable diseases

Veterinary restrictions

- Restricted drug use for food animals
- Emergency Drug Releases
- Withdrawal times
- Liability with antibiotic use without veterinary consent
- Antimicrobial resistance
- Biosecurity measures

Diseases

PARASITES

White Spot or Ich

Ichthyophthirius multifilis

- History: warmer water T (15-25°C), but can occur <10°C, stress, high density
- Behavioural signs: flashing, darting, rubbing, increased respiratory rate
- Gross lesions: white nodules along the skin and gills (parasite ~1mm)

- Diagnosis: wet mounts (**horseshoe shaped nucleus),** histology
- Samples: skin scrapes, gill wet mounts, skin and gills in formalin (+ other).

- Treatment: formalin

Ichthyobodo (Costia)

- History: recent temperature drop
- Behavioural signs: flashing, darting, rubbing, increased respiratory rate
- Gross lesions: bluish or whitish film on body

- Diagnosis: wet mounts (very small parasite, shaped like a balloon attached to gills by the “string”), histology
- Samples: skin scrapes, gill wet mounts, skin and gills in formalin (+ other).

- Treatment: formalin

Monogenes

- History: high densities, declining water quality, low DO, spring blooms
- Behavioural signs: flashing, darting, rubbing
- Gross lesions: can observe parasite grossly (larger species), skin ulcers

- Diagnosis: wet mounts, histology
- Samples: skin scrapes, skin in formalin (+ other).

- Treatment: formalin, salt, hydrogen peroxide

***Notifiable* (*Gyrodactylus salaris*)**

Ergasylus

- History: open water (cage-cultured, pond-raised, wild-caught)
- Behavioural signs: increased respiratory rate
- Gross lesions: observe parasite grossly on gills (~2mm), +/- gill necrosis and hemorrhage

- Diagnosis: wet mounts, histology
- Samples: gill wet mounts, gills in formalin (+ other).

- Treatment: emamectin benzoate (SLICE) ** was EDR**

Diseases

BACTERIA

Coldwater Disease

Flavobacterium psychrophilum

- History: lower water T (<10°C)**, recent fish movement or stressor, early spring
- Behavioural signs: increase in morbidity and mortality
- Gross lesions: skin erosion and ulceration, enlarged spleen in fry

- Diagnosis: wet mounts, histology, microbiology
- Samples: skin scrapes, gill wet mounts, skin, heart, spleen, gills in formalin (+ other).

- Treatment: florfenicol, others, (MIC)

Bacterial Gill Disease

Flavobacterium branchiophilum

- History: overcrowding, low DO, high ammonia, high turbidity
- Behavioural signs: flared opercula, lethargy, coughing, increased respiratory rate
- Gross lesions: large amount of mucous on gills

- Diagnosis: wet mounts, histology, microbiology
- Samples: gill wet mounts, gills in formalin (+ other).

- Treatment: chloramine-T

Columnaris

Flavobacterium columnare

- History: warmer water T (>15°C), recent stressor, late spring to early fall
- Behavioural signs: increased respiratory rate, increase in morbidity and mortality
- Gross lesions: skin erosion and ulceration, gill and skin necrosis with yellow mucoid material

- Diagnosis: wet mounts, histology, microbiology

- Samples: skin scrapes, gill wet mounts, skin and gills in formalin (+ other).
- Treatment: oxytetracycline

Diseases

VIRUSES

VHSV

Viral Hemorrhagic Septicemia Virus

- History: N/A (typically wild fish)
- Behavioural signs: morbidity and mortality
- Gross lesions: hemorrhage along skin, eyes, vent and internal organs

- Diagnosis: histology, PCR, virus isolation
- Samples: organs pooled and refrigerated (heart, spleen, kidney), all representative organs in formalin.
- Treatment: none

Reportable

VHSV management zoning

To slow the spread of VHS in Ontario, the Ministry of Natural Resources established **VHS Management Zones**.

Management actions in relation to the management zones:

- education and awareness efforts for anglers
- restrictions on the movement of commercial baitfish and on the collection of and treatment of wild spawn for stocking

[MNR, 2011]

Aquatic Veterinary Services

- Staff training sessions
- Disease information sessions
- Yearly contracts for full-time-on-call diagnostics and consultation
- No prescriptions without being a current client