

Tropical Fish Disease Diagnosis and Treatments in the Retail Pet Industry

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- USA

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Progression of the Fish

- Fish Farm
- Exporter/Importer/Wholesaler
- Distribution Center
- Store
- Customer's Aquarium

5 Distribution Centers



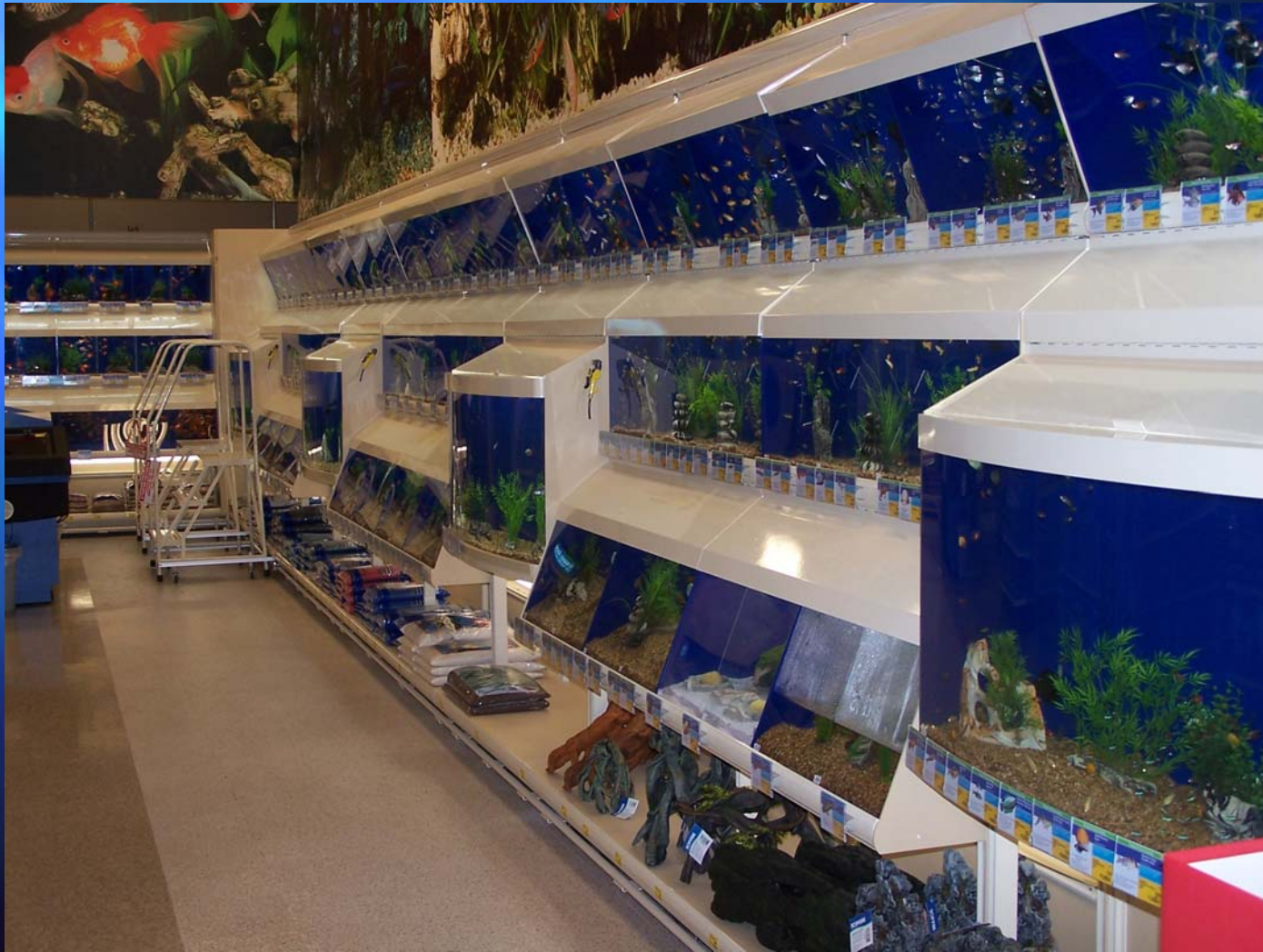
DC Filtration Systems



Packing Line at DC



Store Display



Fish Diagnostic Techniques

- History
- Environmental Assessment
- Water Quality Parameters
- Physical Examination
- Biopsy, Cytology
- Hematology, Cultures
- Necropsy, Histopathology

History

Record a thorough History:

- Species of fish, age, size, weight, gender, source
- Disease signs – Lesions, abnormal behavior
- Is the fish still alive or dead (when did it die)?
- Did the fish die or was it euthanized?
- Environmental conditions, Substrate, Filtration system, Water quality, Water changes
- Diet, Nutritional condition, Reproductive status
- Previous diseases and treatments
- Condition and species of other animals in habitat:
Number of healthy, sick or dead fish.

Physical Examination

Physical condition, External examination
Lesion description by organ system

Record differential diagnoses:

Infectious – Viral, Bacterial, Fungal, Parasitic

Non-infectious - Environmental Disease

- Water Quality, Toxins, Trauma, Tumors, Predation

Angelfish *Pterophyllum scalare*



DIAGNOSTIC TESTS

- Skin, Fin, Gill Biopsies
- Bacterial Cultures
- Fecal Examination
- Blood Tests
- Radiograph
- Ultrasound
- Exploratory Surgery
- Necropsy/Histopathology



Diagnostic Methods

Biopsy collection:

Wet mount preparation (Skin, Fin, Gill biopsies):

Parasites/tissue collected ante- or post-mortem.

Cytology: Smears of tissue, fluid, or swabs collected at necropsy or biopsy and stained for microscopic exam.

Histology: Tissues collected and fixed at necropsy or biopsy and submitted to diagnostic lab.

Culture techniques: Bacteria, viruses, fungi

Skin, Fin, and Gill Biopsies

- Gently scrape a small sample of mucus off the body of the fish. Place this in a drop of water on a microscope slide (wet mount) and cover it with a coverslip.
- Next snip a small section of the caudal or other fin rays using small sharp scissors, such as iris or suture removal or iris scissors.
- Also take a sample of one or two gill filament tips. Place these on a slide and prepare as with the skin scraping. Examine these samples microscopically at 40 to 400X magnifications.



Caudal Fin Margin Biopsy



Gill Filament Tip Biopsy



Biopsy Samples (Necropsy)



Gills

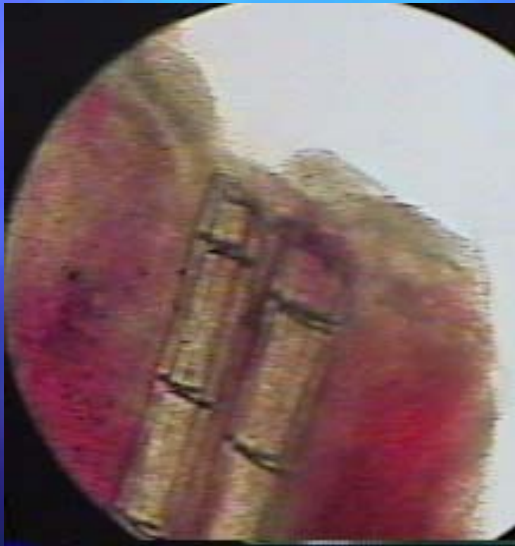


Scale

Skin
Scrape

Fin

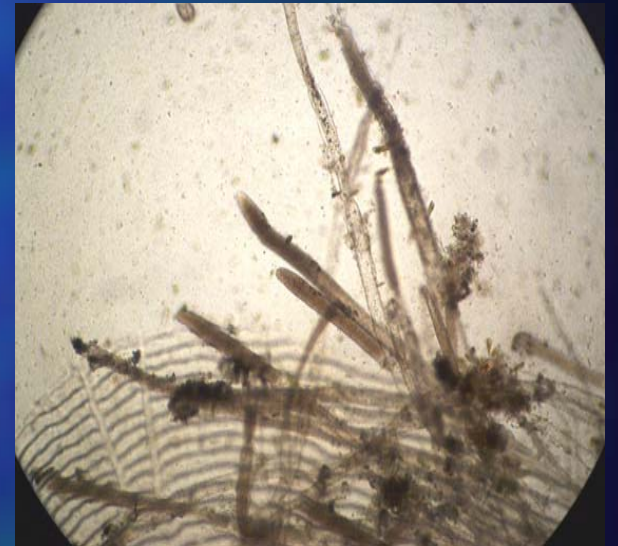
Wet-Mount Microscopic Examination



Fin Biopsy

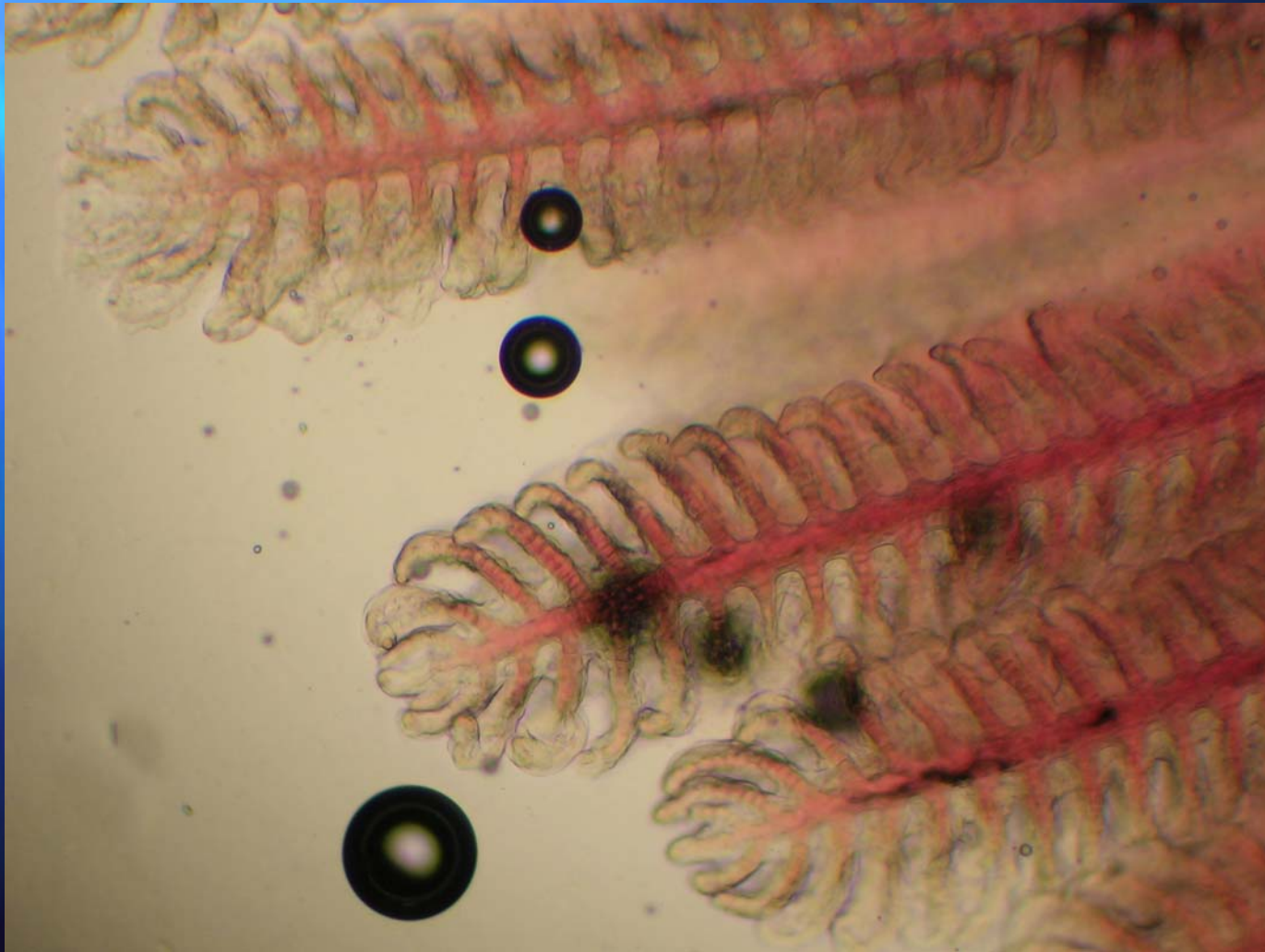


Gill Filaments



Skin Scraping

Normal Gill Tip Biopsy



Betta splendens



Processing Bettas



PARASITIC DISEASES

- Protozoa - *Chilodonella*,
Epistylis, *Ichthyophthirius*,
Trichodina, *Ichthyobodo*
- Trematodes - *Dactylogyrus*
and *Gyrodactylus*
(Gill and Skin Flukes)
- Annelid Worms - Leeches
- Crustacea - *Lernaea*
(Anchor Worms),
Argulus (Fish Lice)



Protozoa Parasites



Ichthyobodo



Chilodonella

- These protozoa parasites all cause similar signs. The parasites feed on the epithelial cells of the fish, resulting in sloughing of the epidermis. A bluish-white film may develop on the skin from excessive mucus production. The fish will have respiratory difficulty and be depressed. Death occurs by asphyxiation due to damage of the gill epithelium. Large numbers of koi may be affected in a short period and die suddenly. Gill biopsies or skin scrapes of affected fish will show large numbers of these parasites.



Epistylus



Trichodina

Ichthyophthirius multifiliis



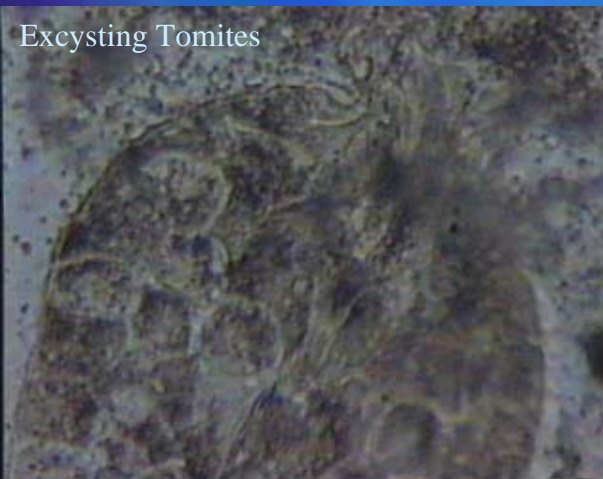
Trophont Time to Maturity

50°F / 10°C = 35 days

60°F / 15°C = 14 days

70°F / 21°C = 5 days

80°F / 27°C = 3 days



Tomont Division Time

39-41°F / 4-5°C = 6 days

64-68°F / 18-20°C = 1 day

77-80°F / 25-27°C = 1/2 day

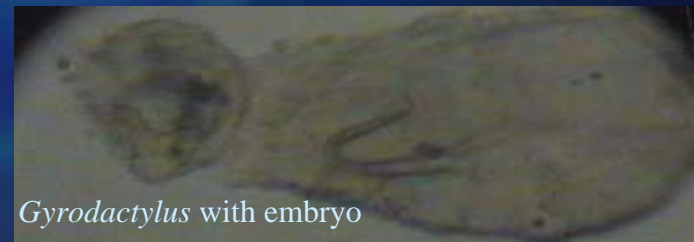


Monogenean Trematodes

- ***Dactylogyrus* (gill flukes) -**
These flukes live on the tips of the gills and occasionally on the skin of fish. They cause gill filament hyperplasia resulting in hypoxia. Signs include rapid respiratory movements, clamped fins, and flashing. Gill tip biopsy will reveal the flukes upon microscopic examination.
- ***Gyrodactylus* (skin flukes) -**
These flukes occur mainly on the skin and fins, but occasionally are found on the gills. They are hermaphroditic and give birth to live young, one at a time. An embryo with hooks is often visible microscopically within the adult. The young are parasitic immediately after birth, often never leaving the original host.



Dactylogyrus with egg



Gyrodactylus with embryo

Crustacea Parasites



Anchor Worm
(*Lernaea*)

- Anchorworms have free swimming larval stages. Once mature, the adult male will mate with a female and then die. The fertilized female develops an anchor shaped head, which it embeds into the skin of the host fish. This causes a reddened sore, which may become secondarily infected with bacteria.
- Fish Lice have two prominent eyes, two sucking discs, and a stylet mouthpart. This stylet repeatedly pierces the skin of the fish and releases toxic secretions. They feed on the tissue fluids released by this trauma. They are freely moving on the host and swim well.



Fish Louse
(*Argulus*)

Neon Tetra *Hyphessobrycon innessi*



Bacterial Culture

- Samples for bacterial culturing are taken from lesions or organs.
- Use sterile technique to avoid contamination.
- Bacteria are grown in culture media at 20-25° C for 3-5 days.
- Growth is identified to bacterial species, and then tested for antibiotic sensitivities.



Fecal Examination



- A fecal sample can be collected from the fish or from the water from the transport container and microscopically examined for bacteria, protozoa, and helminthes ova.

Necropsy Technique

Take notes: small details are easily forgotten

External Exam: morphometrics, carcass condition, skin and fin defects/dyscoloration, lesions

Sterile samples: tissue usually higher yield than effusion

Wet mounts for ectoparasites (protozoa, metazoa)

Collect feces/blood

Impression smears of tissues

GI content: quantity and consistency

Complete tissue set: regardless if normal or not

Multiple smaller sections are better than few large sections

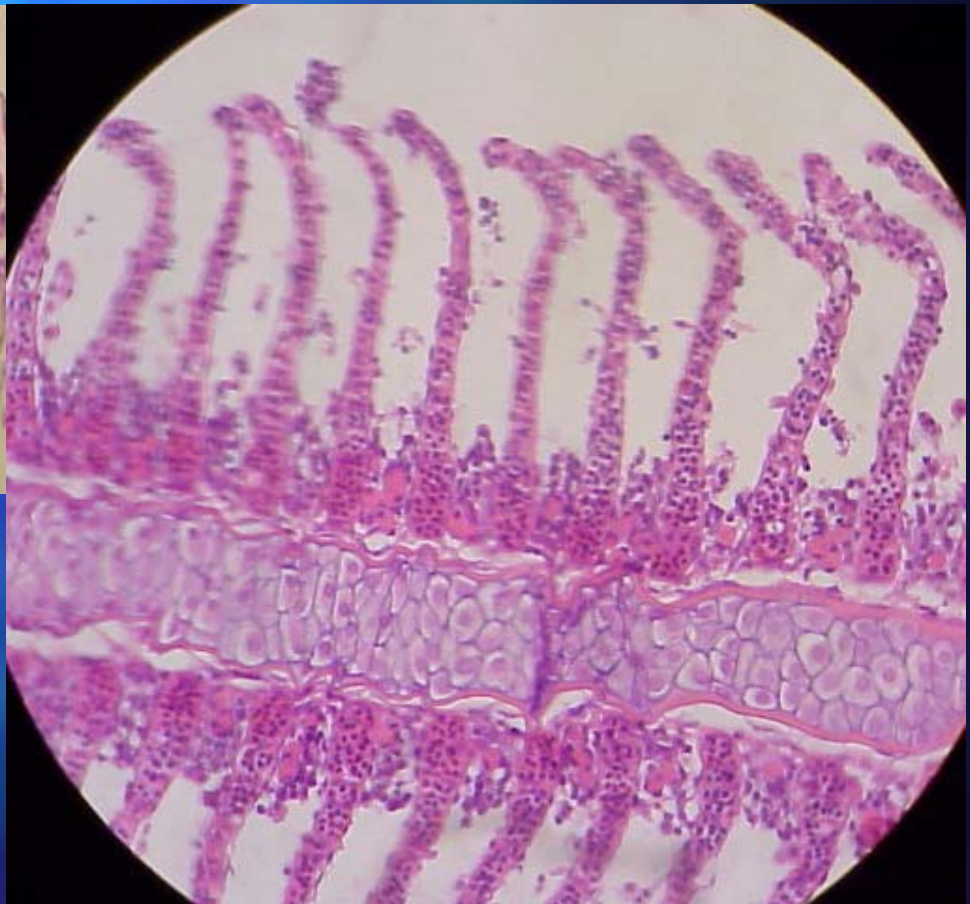
Lesion: active & chronic region

Tissue Sample Thickness < 1cm; in order to be adequately preserved in formalin

Histopathology



Sectioned and stained koi
gill filament
(H&E Stain)



Euthanasia

- Freezing is not an acceptable method of euthanasia by the American Veterinary Medical Association.
- It is preferable and more humane to use an overdose of anesthesia, which will render the fish unconscious quickly, and cause its respiration to cease. Use up to 10 times the recommended anesthetic dose, and leave the fish in the solution for an hour after it has stopped opercular movements.

Goldfish *Carassius auratus*



Medicated Food and Baths



- Antibiotics in Food - Bacteria
- Metronidazole - Intestinal protozoa
- Copper Sulfate - Protozoa
- Formalin - Protozoa
- Minn Finn - Protozoa/Skin Flukes
- Praziquantel - Flukes
- Dimilin - Crustacea parasites

Koi *Cyprinus carpio*



Advertisement

