

FALL SEMESTER 2009

Diseases of Aquatic Animals

PATH*4100

Objectives, lecture outline & other things
University of Guelph
Department of Pathobiology

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Calendar Description:

A course designed to familiarize the fisheries manager, researcher or veterinarian with the basic principles of diagnosis, prevention, and control of disease of free living and captive aquatic animals, with emphasis on fish. Prerequisites: Principles of Disease (PATH*3610) or exemption on permission of Coordinator.

Course Goals:

Provide students with an understanding of fish medicine. Introduce students to basic concepts in gross and microscopic anatomy, microbiology, immunology, pathology, physiology, and water chemistry. The student will be provided with specific details about selected infectious and non-infectious diseases as well as given an opportunity to develop applied techniques that are useful in fish medicine.

Teaching Strategies:

Lectures: Early lectures will present a description of normal (or healthy) gross and microscopic anatomy, as well as introduce basic concepts in microbiology, immunology, pathology, physiology, and water chemistry. The second (middle) series of lectures will then discuss classes of infectious and non-infectious diseases (primarily of fish). The remaining lectures will then help the student to integrate this knowledge into the concept of fish medicine as it relates to disease recognition, prevention, treatment and management. Problem solving will be encouraged using case histories and field situations.

Laboratories: Laboratories are designed to illustrate material presented in lectures either through demonstration or by direct manipulation by individuals or small groups of students. Material is selected to demonstrate phenomena discussed in lectures, to provide familiarity with routine fish handling techniques, and to permit interpretation of methods used for diagnosis, disease surveillance and treatment. Emphasis is placed on encouraging group discussions as an aid to the development of a working understanding of fish medicine through the application of fundamentals given in lectures to actual situations. Problem solving will be encouraged using case material.

Course Objectives:

- 1) To provide an overview of normal gross and histologic anatomy of fish, as well as selected aspects of fish physiology, immunology and general biology.
- 2) To provide an overview of common diseases (infectious and non-infectious) that affect ornamental (pet), commercial (farmed), and wild populations of fish.
- 3) To provide information concerning the strategies of diagnosis, treatment and control of common fish diseases.
- 4) By the end of the lectures and laboratory sessions, the student will be expected to be able to:
 - a) Recognize anatomic structures at the gross and/or histological level, and provide a brief description of their functional significance.
 - b) Provide essential details concerning common diseases (infectious & non-infectious) of ornamental, farmed (trout, salmon & charr, as well as tilapia & catfish) and wild fish.
 - c) Provide suggestions for the control, through management and appropriate chemotherapy, of some specific diseases as well as some common disease classes.
 - d) Perform a necropsy of a fish. Be able to obtain appropriate samples for a basic diagnostic workup.

Course Objectives: (continued)

- 4) By the end of the lectures and laboratory sessions, the student will be expected to be able to:
 - e) Be aware of common clinical manifestations of disease in fish and their significance, that is, know how to recognize a sick fish and what some of the more common clinical signs may mean in terms of possible aetiology.
 - f) Be familiar with basic bacteriological procedures that can be done in non-specialized laboratories, field stations or general veterinary practices.
 - g) Be able to anaesthetize a fish for euthanasia, or for a brief (out of water) examination with recovery to follow (i.e., know how to handle a live fish).
 - h) Be able to obtain a blood sample from the caudal vein, and familiarize yourself with how to inject i.p., and i.m.
 - i) Understand the concept of 'water quality' as it pertains to commercial aquaculture and aquaria.
 - j) Describe the basic methodology for i) Bath treatments, ii) Antibiotic and anti-parasitic treatments, and iii) Topical application of treatment substances.
- 5) Be familiar with the common diseases of selected marine invertebrates, aquatic amphibians and reptiles and marine mammals.

Course Evaluation

Midterm examination	20%
Assignment	20%
Laboratory project	20%
Final examination	40%

The written assignment is intended to be a critical summary/review of your chosen subject area (subject list provided later in the term) that is not exhaustive but requires synthesis of the best papers from that area. You should choose five (5) relatively recent papers that address the **pathogenesis** of the disease/abnormality/condition. Pathogenesis being the factors of host/pathogen relationship that are responsible for infection, tissue invasion and damage, severity of disease, i.e. how the disease develops and causes undesirable effects. **THIS IS NOT A LITERATURE REVIEW.** Include in your paper a summary of why each paper was chosen.

The laboratory assignment will take up the last 3-4 lab periods and will use the knowledge gained in labs until that point. You will be provided with a specimen and (with supervision) will generate a case report (following a template provided) that includes the diagnosis in addition to the interpretations and recommendations for the (virtual) client.

Safety Warning

Within the laboratory setting, serious accidents can occur if students do not act responsibly or (fail to) follow the appropriate procedures. In order to ensure safety of all participants, the procedures/guidelines provided by the instructor must be followed and students must at all times abide by the directions given by the instructor or assistant. Failure to do so could result in the student being dismissed from the lab, and given a grade of zero for that component of the course. It is the responsibility of each student to attend all laboratory sessions in order to be aware of any safety orientation that is provided.

1. A laboratory coat must be worn at all times in the laboratory.
2. Exercise caution when working with specimens since they may contain organisms with pathogenic potential. *(Most organisms used in laboratory exercises are not infectious to humans. Nevertheless you should err on the side of caution when handling these specimens. In addition, biological materials such as blood, lavage fluids, or tissues, including those obtained from 'normal animals', are potentially contaminated and are to be treated as such).*
3. Smoking, eating, mouth-pipetting, nail chewing or other hand to mouth contact is not permitted in the laboratory (After laboratory periods, wash your hands before consuming food).
4. No specimens are to be removed from the laboratory.
5. All sharps (needles, scalpel blades, broken glass) are to be placed in designated containers or disposed of as directed by the laboratory instructors.