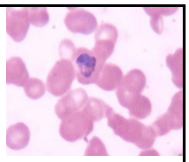
Parasitology (3100:454)

Introduction

Lecture Notes

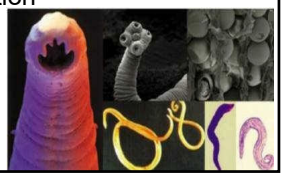


- Taking Notes in Lecture
  - Copies of lecture slides available on Brightspace site
    - Review at home
    - All grades will be on Brightspace throughout the semester
    - Look at sample tests before midterm & final!
  - Email questions to: scw@uakron.edu

Outline of Course

Goals of Course

- Medical orientation
  - Parasites that infect humans and other vertebrate hosts
  - General biology, life cycles, epidemiology, pathogenesis, and treatment of these parasites
- Organismal Biology orientation
  - Ecology of parasites
  - Evolution of parasitic lifestyle
    - >Coevolution



Medical Orientation

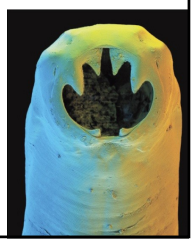
Objectives

- Basic knowledge of parasites
  - Protozoan
  - Metazoan
- Basic biology of parasites
  - Life cycle
    - >Life stages
    - >Interrupting cycle
  - Epidemiology
    - >The study of the causes, distribution, and control of disease in populations
  - Pathogenesis
  - Treatment
    - >Drug therapy NOT on tests!

Medical Orientation

Objectives

- Prepare for medical career
  - Medical Technician
    - >Identification of parasites
    - >Prepare for additional courses in parasitology
  - Medical Students
    - >Diagnosis
    - >Treatment
- Combined approach
  - Lecture material
    - >Basic biology of parasites
  - Laboratory identification
    - >Identification from infected patients



Organismal Biology

Objectives

- Survey a unique lifestyle
  - Mutualism / predation
  - Ecology
    - >Life cycles
    - >Transmission
  - Evolution
    - >Coevolution = arms race
    - >Parasitic infectivity
    - >Host defenses
    - >Why become parasitic?

Course Structure

Tests, Points, & Grading
- Total points = 1000
- Tests
  - Lecture
    - >Midterm = 250 points (25%)
    - >Final = 350 points (35%); cumulative
  - Laboratory
    - >400 points total (40%)
    - >3 practicals @ 100 pts. ea. (not cumulative) - Treat like midterms
    - >2 lab write-ups @ 50 pts. ea.
- Grades
  - Grading on a "modified % curve"
  - Grade range given for each test

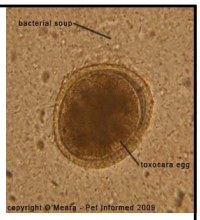
Policy on Cheating

"Rules" of Course
- Must be "diligent" to avoid eye contact with others' tests for lab practicals
- Write-ups must be original works
  - No copying of any portion of others' papers
- Cheaters will be SEVERELY dealt with
  - University rules go as high as expulsion
  - More likely to fail course
- Best to avoid all possible forms of cheating to avoid negative ramifications

Course Structure

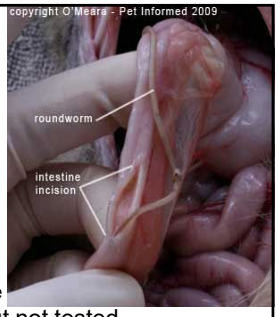
Material Covered
- General parasitic processes
  - Ecology
  - Evolution
  - Immunology
  - Pathology
- Protozoan parasites
  - Flagellates
  - Ciliates
  - Amoebae
  - Apicomplexa

Course Structure



Material Covered
- Metazoan parasites
  - Platyhelminthes (parasitic flatworms)
  - Nematodes
  - Other, smaller groups
    - >Acanthocephalans
    - >Pentastomids
- Ectoparasites are NOT covered
  - Parasitic arthropods (e.g., mosquitoes) & annelids (e.g., leeches)
    - >Parasitic arthropods included in laboratory as important vectors of other parasites

Lecture Material



Important Topics for Tests
- Life cycles
- Pathology
- Ecology
  - Transmission & control
- Evolution
  - Host immune response
  - Evolutionary pathway for parasite
- Taxonomy will be presented but not tested
- Concentrate on important human parasites
  - Other parasites important to know, but less likely to appear on tests
    - >Those used for examples of coevolution important

Laboratory Material

Important Topics for Practicals
- Identification of parasites
  - "Adult" forms
  - Transmission forms
    - >Eggs
    - >Cysts
- Identification of vectors
  - Carriers of disease
    - >Mainly insects
- Basic knowledge of parasitic biology from lecture material
  - >Study as for taking a midterm

Laboratory Material

Studying for Practicals
- Attend labs!
- Keep detailed notebook
  - Composition notebook recommended
- Slide review
  - In-laboratory
- "Open lab" review
  - Outside laboratory hours
  - Microscope slides available
- Group studying recommended
  - Both in and outside of lab

Laboratory Material

Lab Write-ups
- Two "diagnosis" labs
  - Class divided into 2 groups
  - Each group designates one "patient"
  - Patient assigned a parasitic infection
    - >Given a packet of symptoms to divulge to group for diagnosis
    - >Acting ability a plus!
  - Groups order tests of patients for diagnosis
    - >Tests result in being given certain slides to observe for parasitic infection
    - >Continued questioning of patient for further "clues" to infection

Laboratory Material

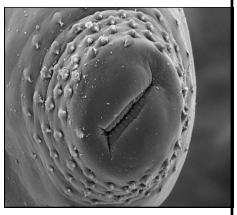
Lab Write-ups
- Group consultation for final diagnosis
  - Diagnosis of parasitic infection
  - Group discussion
- Groups present their diagnosis to class
  - If correct, discuss how diagnosis was conducted
  - If incorrect, discuss problematic features of diagnosis

Laboratory Material

Actual Write-up
- 4-5 page paper on lab
  - Computer-generated
  - Double spaced
- Discuss pathology of parasitic infection
- Discuss the process of diagnosis in your group
- Each student writes their own paper
  - No "group effort"
  - Can discuss with your group

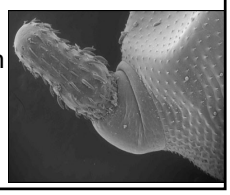
Laboratory Material

General Instructions
- Each student "assigned" a compound microscope
  - Use this scope throughout course
  - Keep clean and in good condition
- Slides
  - Observe slides and return to trays
  - Demo slides for rare slides
  - Report broken slides immediately
  - Do NOT remove slides from lab!
    - >If slides "disappear," we will have to employ a complex (and time consuming) check-out procedure



Concluding Remarks

General Goals
- Attain a sufficient mix of "applied" and "basic" knowledge of parasitology
  - Medical = applied
  - Organismal = basic
- Combine lectures with hands-on examination of parasites
- Ultimately, attain an appreciation for the diversity of life on the planet



Next Lecture

Ecology and Evolution of Parasites

- Definition of terms
- General ecological problems for parasites
- Evolution of parasitic lifestyle
  - Coevolution
  - Free-living --> parasitic