حكومة اقليم كردستان العراق
رئاسة مجلس الوزراء
وزارة التعليم العالي والبحث العلمي
رئاسة جامعة صلاح الدين - اربيل
كلية التربية / شقلاوة
قسم البايولوجي

حکومەتی هەرێمی کوردستانی عێراق
سەرۆکایەتی ئەنجومەنی وەزیران
وەزارەتی خوێندنی باڵاو توێژینەوەی زانستی
زانکۆی سەلاحەدین - هەولێر
کۆلێژی پەروەردە / شەقڵاوە
بەشی بایۆلۆجی

KURDISTAN REGIONAL GOVERNMENT - IRAQ / COUNCIL OF MINISTERS
MINISTRY OF HIGHER EDUCATION & SCIENTIFIC RESEARCH / SALAHADDIN UNIVERSITY - ERBIL

ژمارە: ٢٨١
No:
زاینی: ٢٠٢٢/ ٦/ ٢٢ کوردی: / / ٢٧١
Date: / / 201

بۆ بەڕێز / کۆلیژی تەکنیکی شەقڵاوە/ بەشی شیکاری نەخۆشییەکان / هۆبەی دڵنییایی جۆری

بابەت / سەرپەرشتیکردن و وانە ووتنەوە

سڵاو و ڕێز...

پێتان ڕادەگەیەنین کە بەڕێز (د.مؤید احمد محمود) بۆ ساڵی خوێندنی 2022-2023 لە بەشەکەمان سەرپەرشتی پرۆژەی دەرچوونی قوتابیانی قۆناخی چواری کردووە بە ناونیشانی:

Isolation of foodborne pathogenic bacteria from raw celery (Apium graveolens)

هەروەها بەڕێزیان وانەی پاراسیتۆلۆجی لە وەرزی یەکەم و دووەم لە قۆناخی چوار ووتۆتەوە.

لەگەڵ ڕێزماندا

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Course Handbook

Ministry of Higher Education and Scientific research

Salahaddin University- Erbil

College of Education/ Shaqlawa

Biology Department

Fourth Year: First Semester

Subject: **Parasitology**

Academic Year: 2022-2023

Lecturer names:

Lecturer: Dr. Muayad A Mahmud (Theory and Practical)

Course Book

1. Course name	Parasitology
2. Lecturer in charge	Lecturer, Dr. Muayad A Mahmud
3. Department/ College	Biology Dept./ College of Education/Shaqlawa
4. Contact	E-mail: muayad.mahmud@epu.edu.iq, Mob.: 00964 750 4773872
5. Time (in hours) per week	Total (8) hours weekly: Theory (2) hrs. Lab. (6) hrs.
6. Office hours	2 Hours per week
7. Course code	EdB1401
8. Teacher's academic profile	**Education:** • Obtained B.Sc. in Biology from the College of Science/ Salahaddin University-Erbil during 2003-2004. • Obtained M.Sc. Microbiology from Savitribai Phule Pune University /Pune, India 2007-2010. • Obtained PhD Microbiology, University of Nottingham/Nottingham, United Kingdom 2015-2016 **Experiences & Qualifications:** • 1 Medical Lab technician , Medical Lab Technology Department, Erbil Polytechnic University/Erbil-Iraq April 2005 – Sep. 2006 • 2 Head Department Assistant, Medical Lab Technology Department, Erbil Polytechnic University/Erbil-Iraq Oct. 2006 – July 2007 • 3 Course Coordinator and Teacher in charge, Medical Lab Technology Department, Erbil Polytechnic University /Erbil-Iraq March 2010-Aug. 2011 • 4 Head, Medical Lab Technology Department and head of Safety Committee, Erbil Polytechnic University/Erbil-Iraq Sep. 2011 – Sep. 2012 • 5 Research Technician, School of Life Sciences, Nottingham University/ Nottingham- UK Nov. 2015 – Aug. 2016 • 6 Monitoring and Evaluation Officer, Iraqi Almortaqa Foundation for Human Development (Local NGO) /Erbil-Iraq Nov. 2016 – June 2017 • 7 Head of Medical Lab Technology Department, Erbil Polytechnic University /Erbil-Iraq March 2020 – April 2021 • 8 Nuclear Medicine Manager, Medya Diagnostic Cneter/Erbil • Researcher at Erbil Polytechnic University /Erbil-Iraq March 2016 – So far.

9. Keywords	

10. Course overview:

Course overview:

- The Medical Parasitology course provides an overview of the human parasites and their diseases. Topics include the basic concept of protozoan parasite classes, Sarcodina, Flagellate ciliate, sporozoa and medical helminthology. Special emphasis is placed on topics that related to humans health such as host-pathogen interactions and laboratory diagnostic methods. The earliest agents of human infection to have been observed were parasites. Medical parasitology deals with the parasites which cause human infections and the disease they produce. Parasites are organisms that infect other living beings. They live in or on the body of other living beings, the host and obtain shelter and nourishment from it. They multiply or undergo development in the host.

- These subjects are important for medical laboratory techniques departments' student, because the requirements future job of these students is diagnosis of disease agents and the parasite which cause the disease. By learning the contents of this subject, students can able to do the essential activities.

- Getting information is very important because of the infections of humans caused by parasites number in the billions and range from relatively innocuous to fatal. The diseases caused by these parasites constitute major human health problems throughout the world. (For example, approximately 30 percent of the world's population is infected with the nematode Ascaris lumbricoides.) The incidence of many parasitic diseases (e.g., schistosomiasis, malaria)

11. Course objective:

After participating in the course, students would be able to:

1. Define and classify the medically important parasites based on morphology, biology and clinical criteria
2. Describe the life cycle, morphology, infective stage stages, diagnosis stage, sources of infection and mode of transmission of each parasite with a view of prevention and control of parasitic diseases.
3. Identify the parasites at different stages of life cycle, their vectors and hosts by microscopic examination.
4. Identify the deferent larval stages of the parasites during life cycle and pathogenesis steps.
5. Apply suitable methods for parasites detection.
6. Use applicable tools for parasitic disease control and prevention.
7. Combine between vectors and parasitic disease to make a good control plan. pathogen

12. Student's obligation

This subject is very important because of directly related to health and therefore to obtain the students more and enough information about it they are needing in to the lectures and they participtate by their activity example writing repotts or preparing seminars

13. Forms of teaching

We will be responsible for providing lecture handouts/notes in advance to students in order to have a copy of materials. All possible facilities for students will be applied in the class such as projector, whiteboard, pens, animation videos for further information and clarification.

The practical session will include lab works such as direct specimen examination under microscopes and using of preserved parasites either on glass slides (micro parasites mostly protozoans) or macro parasites preserved in formaldehyde and ethanol.

14. Student learning outcome:

1. Apply principles of safety, quality assurance, and quality control.
2. Evaluate specimen acceptability.
3. Describe basic morphology and physiology of parasites.
4. Classify parasites.
5. Perform appropriate laboratory techniques used in the processing of specimens and identification of parasites
6. Evaluate and correlate test results with patient condition(s).

15. Course Reading List and References

- Modules in Life Sciences Series, Jack Chernin - Parasitology-CRC Press (2000)
- Analytical Parasitology, John Barrett (auth.), Dr. Michael T. Rogan (eds.), Springer Berlin Heidelberg (1997)
- Advances in Parasitology, J.R. Baker, R. Muller (Eds.), Vol. 30-Academic Press (1991)

16- Course topics (Theory)	Weeks	Learning Outcome
Introduction of parasitology	1	Definitions , types of parasite, host parasite relationship, geographical distribution, pathogenesis, common, name, scientific name, life cycle
Introduction of protozoa	2	General introduction about Protozoa which comprise, shape, life method, reproductive mode, movement method by flagella, pseudopodia and cilia, life cycle, laboratory diagnosis, classification of protozoa
Entamoeba histolytica & Entamoeba coli	3	Entamoeba histolytica, Amoebiasis, scientific name, disease, habitat, amoebic dysentery, acute and chronic. pointing to the amoeba which have the same resemblance in shape for the comparison among them practically. Appearance and shape characteristics of trophozoite, and cyst
Mastogophora: General introduction-Ciliates	4	Classification, motion organs. Giardia lamblia , Trichomonas vaginals, and . Balantidium coli. : Habitat, disease, characteristics, motion, reproduction, life cycle, laboratory diagnosis
Blood flagellates, Leishmania sp. & Trypanosoma sp.	5	Introduction about blood flagellates: Special growth stages in vertebrate and invertebrate that comprise: 1- Amastigote, 2- promastigote, 3- Epimastigote, 4- - tripomastigote . Leishmania tropica , - Leishmania braziliense and -L. donovani, Trypanosoma gambience .,- Trypanosoma rhodesie and - Trypanosoma cruzi.
Blood parasites Plasmodium sp.	6	: Introduction to malaria parasite in human 1- P. malaria 2- P. vivax 3-P. falciparum 4- P. ovale Disease of each parasite, reason about name, vector, life cycle in human and female anopheles, liver cycle, blood cycle, tissue cycle. Laboratory diagnosis
Toxoplasma gondii	7	Toxoplasma gondii: Classification, nomenclature of infective stage. Host and types of it. Transmission of parasite to the embryo. Toxoplasmosis.
Introduction to Helminthes	8	. Classification, Characteristic of each phylum of helminthes.
Cestoda ... Echinococcus granulosus Taenia saginata & Taenia solium	9	Teania saginata and T. solium: Echinococcus granulosus, General description of worms, habitat, external morphology, head, neck, mature segment and gravid segment. Intermediate host. Life cycle. Laboratory diagnosis. Shape of eggs.
trematodes..Fasciola hepatica	10	Introduction about Trematodes and classification method General description of Fasciola hepatica
trematodes.. Schistosoma sp.	11	S. haematobium 2- S. mansoni 3- S. japonicum Reproductive method, its habitat in the body, Disease , life cycle.
Introduction to the Nematodes	12	Ascars lumbricoids. Entrobius vermicularis General description of worms according to the shape. Life cycle. Laboratory diagnosis.
Hoook worms	13	A doudenae and N. americanus General description, Disease, life cycle, Diagnostic Method
Medically important arthropods	14	· Introduction to the medical insect

17- Practical Topics	Week	Learning Outcome
Introduction of parasitology	1	. Identify the three groups of clinically significant parasites
Collection of parasite specimens	2	Identify the specimen used and the procedures of collection
Methods of parasite examination	3	Describe the procedures used in the microscopic examination of stool.. Discuss the purpose of a wet prep examination
Amoebic protozoa	4	Differentiate types of pathogenic ameba's from other non pathogenic amoeba Compare and contrast trophozoites and cysts
Flagellated protozoa	5	Determine the specimen of choice Giardia intestinalis (lambia). Determine the specimen of choice and alternative specimen types as well as appropriate diagnostic technique for Trichomonas vaginalis
Hemoflagellates	6	Describe the appearance of hemoflagellates on blood smears. , Differentiate between amastigotes, promastigotes, epimastigotes, and trypomastigotes, Identify the specimen of choice for the isolation of hemoflagellates. (Trypanosoma , Leishmania sp.)
Blood parasites (Plasmodium species)	7	Identify the vector of transmission for Plasmodium species Describe how malaria disease is diagnosed in the laboratory and diagnose stages of parasite
Toxoplasma gondi	8	Describe how toxoplasmosis diagnosed in the laboratory
Platyhelminths (cestods)	9	a. Describe how Taenia saginata and Taenia solium. Diagnosed in lab. b. Describe the common physical characteristic shared by Cestoda
Echinococcus granulosus	10	Describe how echinococcosis diagnosed in the laboratory , Identify eggs of worm
Playhelmiths (trematodes)	11	a. Identify the egg form of Shistosoma species b. Describe how Fasciolosis diagnosed in the laboratory
Nematehelminths (nematode)	12	Identify the egg form of Enterobius vermicularis (pin worms). Diagnosing Ascars lumriciodes
Review	13	List parasites that are commonly mistaken for white blood cells due to their size and shape

18. Questions Bank Example:

Theory

1) What is a parasite?

The organism that depends on the host (other organisms) for all of its lifecycle or for some parts of its lifecycle is known as a parasite.

2) What is the host?

The host is any organism or animal that harbors the parasite.
There it provides nourishment and shelter.

3) What is the difference between definitive, intermediate, and reservoir host?

Definitive host: Sexual reproduction of parasites takes place. In its most highly developed form of a parasite occurs. Examples: Mosquito is the definitive host of the malarial parasite. Humans are the definitive host for Taenia saginata.
Intermediate host: Asexual form of parasite takes place. It is essential for the completion of the lifecycle of the parasite. Examples: Cattle are the intermediate host for Taenia saginata. Tsetse fly for Trypanosome.
Reservoir host: Host which harbors the parasites and serves as an important source of infection to other susceptible hosts. The infected person or animal may act as a reservoir (source of parasitic infection) for transmission. Examples: Dog is the reservoir host for cystic echinococcosis. Antelope is the reservoir host of African Trypanosomiasis.

4) What is the difference between ectoparasite and endoparasite?

Ectoparasite: Lives on the outer surface or in the superficial tissue of the host. Example: Lice.
Endoparasite: Lives within (inside) the host. Example: Roundworm.

5) Define

Temporary parasite: visits host for a short period of time.
Permanent parasite: leads a parasitic life throughout the whole period of its life.
Facultative parasite : lives a parasitic life when opportunity arises.
Obligatory parasite: which cannot exist without a parasitic life.
Occasional or Accidental parasite: attacks on the unusual host.
Wandering or Aberrant parasite: happens to reach a place where it cannot live.

6) How does reproduction occur in protozoa ?

Asexual multiplication: a) By binary fission b) By multiple fission or schizogony
Sexual multiplication: a) By conjugation b) By syngamy or sporogony

7) Classify the pathogenic protozoa on the basis of the organ of locomotion.

Rhizopoda: move with the help of pseudopodia.
Mastigophora: have elongated, thread-like filaments, flagella (Trypanosoma).
Sporozoa: exhibit no movement. Example: the malarial parasite.
Ciliata: move with the help of cilia. Example: Balantidium coli.

8) What do you mean by pseudopodia?

In order to engulf food material, protozoa have false feet like structure which is called pseudopodia. It looks like feet and helps in movement.

9) What is the difference between flagella and cilia?

Flagella are hair-like long filaments whereas cilia are short processes.

Q10/ Choose the correct answer?

1) Protozoa has …….classes.
a. Two b. Three c. Four
2) which of the following is Intestinal parasites.
a. Entamoeba b. Naegleriac. Acanthamoeba
3) Plasmodium is the Species of ……..
a. Sarcodina b. Sporozoac. Ciliates
4) which of the Cestod causes Hydrated cyst?
a. Taeniab. Echinococcusc. Schistosoma
5) Incubation period of Plasmodium.Falciparum is……
a. 8-11 days b. 18-40 days c. Few months
6) A Diarrheal Stool sample came to the lab, you find spinning movement. What will be your diagnosis?
a. Giardiasis b. Ascariasisc. Ancyclostomiasis
7)A Patient came to the hospital with the following symptoms, Pneumonitis, loss of appetite,nausea, vomiting, and vague abdominal pain.What will be your diagnosis?
a. Ascariasis b. Giardiasisc. Ancyclostomiasis
8) Stool sample came to lab, you find football shape egg on microscope with a diameter of 50- 54 micrometer. What will be your diagnosis?
a. Giardiasisb. Trichuriasisc. Ascariasis
9) Plasmodium Falciparum completes his lifecycle in……..hours.
a. 45-hour b. 48-hour c. 40 hour
10) which Blood film used to identify the species of parasite?
a. Thick film b. Thin Film c. Both

Practical

Answer the following multiple choice questions

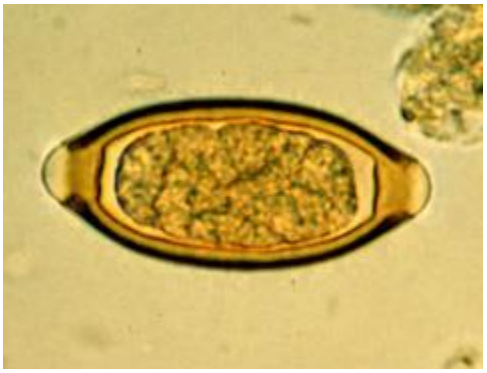
1. Taenia solium is passed from the secondary host to humans by

   a. Eating ground squirrel brains
   b. Eating undercooked pork
   c. Drinking feces-contaminated water
   d. Wading in snail-infected streams

2. Trypanosoma cruzi is the causative agent of

   a. African sleeping sickness
   b. Delhi boil
   c. Leishmaniasis
   d. Chagas' disease

3. Please identify the organism shown in this picture and describe its life cycle?



4. Write a short description of the life cycle of Trichuris trichiura (whipworm)?