



وزارة التعليم العالي والبحث العلمي
الجامعة التقنية الشمالية
اسم التشكيل :- المعهد التقني الدور



الحقية التعليمية

قسم تقنيات المختبرات الطبية

protozoa

اسم المقرر:

Second

المرحلة / المستوى:

first

الفصل الدراسي:

٢٠٢٦/٢٠٢٥

السنة الدراسية:



protozoa				اسم المقرر:
Medical Laboratory Technologies				القسم:
Dour Technical Institute				الكلية :المعهد
Second				المرحلة / المستوى
First				الفصل الدراسي:
2	1	عملي	نظري	عدد الساعات الاسبوعية:
3				عدد الوحدات الدراسية:
				الرمز:
*	كلهما	عملي	نظري	نوع المادة
No				هل يتوفر نظير للمقرر في الاقسام الاخرى
-				اسم المقرر النظير
-				القسم
-				رمز المقرر النظير
معلومات تدريسي المادة				
Tuqa Mohamad abd				اسم مدرس (مدرسي) المقرر:
biology				اللقب العلمي:
2023				سنة الحصول على اللقب
ماجستير				الشهادة:
2022				سنة الحصول على الشهادة
5				عدد سنوات الخبرة) تدريس(

الوصف العام للمقرر

يكتب في هذا الجزء وصفاً عاماً و ملخصاً للمقرر الدراسي:-

Understanding the idea of protozoa as well as the component of parasite and method diagnosis

1. اسم المقرر

protozoa

2. رمز المقرر

MLT206

3. الفصل / المستوى

First/Second

4. تأريخ اعداد الوصف

2024/3/7

5. اشكال الحضور المتاحة

Weekly presence

6. عدد الساعات الدراسية (الكلية / عدد الوحدات (الكلية)

3 / 45

7. اهداف المقرر

The goal of the course is to •
make
sense of the fundamental
concepts and terminology of
protozoa , classified protozoa ,
type of host l, and type of
parasitepathoginc — diagnosis
method .

اهداف المقرر
الدراسي

8. استراتيجيات التعليم والتعلم

Explanation of the course •

Daily exams •

Student groups •

Field visits •

9. بنية المقرر

weeks	times	Subject	Learning method	Attendance Forms	Method of examination
First	3	Definition of	Explain the	Classroom	Exams
		parasitology, types, and Relationship to other natural and biological sciences	lecture, PowerPoint presentations, and practical applied	and Laboratory	
Second	3	Classified parasite and type of parasite	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Third	3	Type of host is method ,	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Fourth	3	Classified protozoa	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Fifth	3	,Entameba histolytica. Pathogenic amoeba	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Sixth	3	flagellates.	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Seventh	3	Giardia lamblia	Explain the lecture, PowerPoint	Classroom and Laboratory	Exams

			presentations, and practical applied		
Eighth	3	Trichomonas Morphology, pathogenic ,diagnosis	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Ninth	3	Leshmania morphology pathogenic diagnosis method	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Tenth	3	Trypanosoma morphology ,pathogenic ,diagnosis method	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Eleventh	3	ciliophora	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Twelve	3	Blattellidum coli morphology ,pathogenic ,diagnosis method	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Thirteenth	3	Sporozoa	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
Fourteenth	3	Plasmodium morphology ,pathogenic ,diagnosis method	Explain the lecture, PowerPoint presentations,	Classroom and Laboratory	Exams

			and practical applied		
Fifteenth	3	Toxoplasma gondii	Explain the lecture, PowerPoint presentations, and practical applied	Classroom and Laboratory	Exams
1.تقييم المقرر					
Daily, monthly, and final exams, as well as weekly reports.					
2.مصادر التعلم والتدريس					
scientific books					
Main references for parasite					

Scientific papers for parasite Online scientific resources	
الاهداف العامة	
knowledge of the mechanisms of action of parasite. studying type parasite The study parasite of antigens, antibodies, and antigen receptors. Understand how parasite to microorganisms develops. Understanding of protozoa classified. Study of pathogenic , morphology ,diagnosis method	
الأهداف الخاصة	
Study parasite and the components of the protozoa and how to protect the body from infections and pathogens.	
الأهداف السلوكية او نواتج التعلم	
The learner has to be aware of the significance parasite fundamentals and understand the components of the. protozoa The learner must understand the difference between parasite and host. The student should be able to provide some information about	

the basics of parasite and how to work in the parasitology laboratory.

((Educational aims): After finishing the lesson (lecture), the learner will be able:-

Knows the basics of protozoa.

Recognize the many forms of **parasite** and know how to differentiate them .

المتطلبات السابقة

- اذكر أي متطلبات سابقة قد يحتاجها الطالب قبل التسجيل في المقرر، مثل مواد دراسية سابقة أو مهارات معينة.

Recognize parasitology and study of protozoa functions and interactions with pathogens, diseases, and other biological processes. it is critical for understanding and controlling infectious diseases, as well as medicinal treatments. As well as the field of parasitology has also increased in significance because of its increasing applications in several areas such as biotechnology, pharmaceuticals, healthcare, and research

الأهداف السلوكية او مخرجات التعليم الأساسية		
ت	تفصيل الهدف السلوكي او مخرج التعليم	آلية التقييم
1	Student Understanding of parasitology	Lectures. Home works and participation. Discussions and tests.
2	The student gets the ability to identify parasitology types.	Research and skill development through scientific reports
3	provide to Ability parasitology information	Home works Tests
4	The student's understanding of the significance of protozoafor the human body	Home works Tests

أساليب التدريس) حدد مجموعة متنوعة من أساليب التدريس لتناسب احتياجات الطلاب
ومحتوى المقرر)

الاسلوب او الطريقة	مبررات الاختيار	
1. Lectures and practical lectures	Classical lectures	
2. Interactive and mutual learning	Interactive Lecture	
3. Learning via reasons and evidence	The skill of interpreting information	
4. Discussion at the finish of the lecture	Provide abstract and understanding of the topic	

عدد الوحدات	الساعات الاسبوعية			المستوى	رمز المقرر	اسم المقرر
	مج	ع	ن			
6	6	4	2	الثاني	MLT206	Protozoa

Aims of subject

-: General aims

having an idea about the human pathogenic parasites and its diseases
.and the lab. Diagnosis of its

-: Special aims

To know how can be analyzed different techniques of diagnosis the
.pathogenic parasites

Theoretical syllabus	
Weeks	Topics
1	Defines the parasites ,parasitology types of parasites Types of host Classification of parasites

	Protozoa + metazoan [helminthes and arthropoda] Metazoa
2	Introduction generally in characteristic feature of -:protozoa and classification ciliate)) Cilophora, Mastigophora, Rhizopoda Telospora,
3	Rhizopoda Class Pathogenic amoeba <u>histolytica</u> <u>Entamoeba</u> Lab.diagnosis,Pathogenicity ,Morphology ,life cycle
4	-: Few of morphology ,pathogenicity ,diagnosis of canthomoeba ,Naegleria A , <u>gingivalis</u> <u>Entamoeba</u>
5	amoeba Non pathogenic . <u>histolytica</u> .E and <u>coli</u> <u>Entamoeba</u> Different between <u>Iodamoeba</u> and morphology , Lab, diagnosis of <u>Dientamoeba</u> , <u>dispar</u> .E, <u>nana</u> <u>Endolimax</u> , <u>butschlii</u> <u>fragilis</u>
6	or Flagellates generally Mastigophor Class introduction in characteristic feature and classification in (intestinal flagellate, blood and tissue flagellates .(,genital flagellates -: Intestinal Flagellate <u>Trichomonas</u>, <u>mesnili</u> <u>Chilomastix</u>, <u>lamblia</u> <u>Giardia</u> Morphology ,life cycle ,pathogenicity ,and , <u>hominis</u>

	. lab. Diagnosis
7	Genital flagellate <u>vaginales</u> <u>Trichomonas</u> Oral flagellates <u>tenax</u> <u>Trichomonas</u> Morphology ,pathogenicity and lab. diagnosis Tissue and blood flagellate .forms Haemoflagellates
8	<u>donovani</u> <u>Lishmania</u> <u>tropica</u> <u>Lishmania</u> <u>brazeliencis</u> <u>Lishmania</u> Morphology ,life cycle ,pathogenicity, Lab. diagnosis
9	<u>cruzi</u> <u>Trypanosoma</u> <u>brucei</u> <u>Trypanosoma</u> Morphology ,life cycle ,pathogenicity, Lab. Diagnosis .Reduviid bug fly and Tse-tse Sample of
10	(cilata) Ciliophra Class <u>coli</u> <u>Blantidium</u> Morphology ,life cycle ,pathogenicity, Lab. diagnosis

11	Review
12	Sporozoa Class Generally introduction of characteristic features of spp. In <u>Plasmodium</u> Life cycle in generally of .sporozoa .man and insects
13	<u>vivax Plasmodium</u> <u>ovale Plasmodium</u> pathogenicity, Lab. diagnosis
14	<u>malariae Plasmodium</u> <u>falciparum Plasmodium</u> pathogenicity, Lab. diagnosis and short notes of in lab. defferentes spp. The Babesia parasites . <u>Plasmodium</u> spp diagnosis with
15	<u>gondii Toxoplasma</u> , <u>belli Isosporia</u> Morphology ,life cycle ,pathogenicity, Lab. diagnosis

Practical syllabus	
.Weeks No	Topics
1	, Information of parasitic Lab. diagnosis work . Collection of sample .Preservation and Fixatives solution

2	General stool examination and preparation of Iodine, .Eosin and saline solutions
3	<u>Entamoeba histolytica</u> .Permanent slides and stool examination
4	Slides of <u>Entamoeba gingivalis</u> <u>Blastocystis hominis</u> and <u>coli</u> .E and stool examination for <u>Entamoeba coli</u> <u>Blastocystis hominis</u>
5	Slides of stool , <u>Iodamoeba butschlii</u> , <u>Dientamoeba fragilis</u> . <u>Endolimax nana</u> examination
6	Slides of stool <u>Chilomastix mesnili</u> , <u>Giardia lamblia</u> examination
7	, <u>Trichomonas hominis</u> <u>Trichomonas</u> , <u>vaginalis</u> slides <u>Trichomonas tenax</u> Stool examination Haemoflagellates (Lab. diagnosis <u>Lishmania</u>) <u>tropica</u>
8	(Lab. diagnosis <u>Lishmania</u>) <u>donovani</u> sample of sand fly
9	(slides <u>Trypanosoma</u>) <u>cruzi</u> (slides <u>Trypanosoma</u>) <u>brucei</u>

10	bug Reduviid, fly tse – Tse With sample of Slides of Balntidum Coli Stool examination
11	(first one)Review , examination
12	, Anopheline spp. Sample <u>Plasmodium</u> Life cycle of (preparation of blood film (Thick and thin blood film
13	Slides of . <u>Plasmodium ovali</u> , <u>Plasmodium vivax</u>
14	Slides of <u>Plasmodium falciparum</u> , <u>Plasmodium malariae</u> , <u>belli</u> <u>Isospora</u> Slides of
15	<u>Toxoplasma gondii</u> With lab. diagnosis

خارطة القياس المعتمدة

عدد الفقرات	الأهداف السلوكية					الأهمية النسبية	عناوين الفصول	المحتوى التعليمي
	التقييم	التحليل	التطبيق	الفهم	المعرفة			
5	%20	%10	%25	%10	%35	%100	تعريف علم الطفيليات أنواع الطفيليات	الفصل الاول / المستوى الثاني
5	%20	%10	%25	%10	%35	%100	الطفيليات والأمراضية	الفصل الاول / المستوى الثاني

Target Population

الاسبوع الاول أ.الفئة المستهدفة

Parasitology

Parasitology disorders or disease

Parasite division

طلبة المرحلة الثانية-قسم المختبرات الطبية

ب-المحتوى

-الاختبار القبلي(pre-test)

Q1 /What is Parasitology Q2/What are the types of parasite?

Parasitology: is the science which deals with living organisms which live temporary or permanently on or within other organisms for the purpose of procuring food and shelter.

Medical parasitology: is the branch of parasitology dealing with parasites living in or on the body of human which infect him to produce diseases. 3)

Parasites: Organisms that infect other living beings. They live in or on the body of another living being called host and obtain from it nourishment and shelter.

Types of Parasites:

1-Ectoparasite (external parasite): Which inhabit the body surface only without penetrating into the tissues like lice, ticks, mites, mosquitoes, and fleas.

2-Endoparasite (internal parasite): Which live within the body of the host like all protozoan and helminthes parasites.

3- Pathogenic parasite: Which causes infection to the host by its toxic or mechanical activity.

4-Temporary parasite: It is a free-living parasite which occasionally visits the host for obtaining food.

5-Permanent parasite: Which remains on or in the body of the host from early life until maturity.

6-Facultative parasite: Organism which may exist in a free- living state or may become parasitic.

7-Obligate parasite: It is an organism which is completely dependent on the host.

What is the Host and its Types:

The host is the organism or animal in which the parasite lives.

Types of Hosts:

1-Definitive (final) host: The host in which the adult stage lives or sexual mode of reproduction takes place.

2-Intermediate host: The host in which the larval stage of the parasite lives or the asexual multiplication takes place.

3- Reservoir host: It is an animal that can harbor the parasite and can be a potential source of infection for man.

4- Vector host: It is usually an arthropod (insect) that carries the parasite to its host.

Types of Vectors:

A- Mechanical vector: Only transports the parasite without any role in the life cycle (e.g. fly).

B- Biological vector: The parasite undergoes development or multiplication in the body of the vector (e.g. mosquito).

Parasite-Host Relationship:

* Symbiosis: It is the relationship between a parasite and host. Types of symbiosis include:

1-Mutualism: A symbiotic relation beneficial to both organisms (e.g. flagellate in termite intestine).

2-Commensalism: One organism benefits and the other is neither benefited nor harmed (e.g. Trypanosome musculi in rat's blood).

3-Parasitism: One organism (parasite) depends upon another (host) for existence and usually causes harm or disease.

4-Phoresis: Two symbionts travel together without physiological or biochemical dependence.

-الاختبار البعدي (Post-Test)

Q/What are type of host?

Q/What is the difference between parasite and host ?

-الاسبوع الثاني والثالث

-الاختبار القبلي (pre-test)

Q/ What classified protozoa ?

Q/what is protozoa ?

Protozoa (protas = first, zoon = animal) Protozoa are single-celled organisms capable of performing all biological functions including nutrition, growth, and reproduction. Most are microscopic, though some are visible to the naked eye. They exhibit a wide variety of forms and lifestyles, including free-living and parasitic types. Characteristics of Protozoa:

Shape: Oval, rounded, or irregular. Composed of protoplasm with a transparent outer layer (ectoplasm) for movement, secretion, and protection. The inner layer (endoplasm) contains food vacuoles and the nucleus.

Movement: - Sarcodina: by pseudopodia - Sacromastigophora: by flagella - Ciliophora: by cilia - Sporozoa: no movement organelles

Classification of Protozoa:

: - By Habitat

* Intestinal and urogenital protozoa * Blood and tissue protozoa –

By Motion:

Amoebae (pseudopodia): e.g., Entamoeba histolytica

Flagellates (flagella): e.g., Giardia lamblia, Leishmania tropica

Ciliates (cilia): e.g., Balantidium coli

Sporozoa (no locomotion): e.g., Plasmodium vivax

الاختبار البعدي (post test)

Q/ What is protozoa classify according to their habitat ?

Q/ What is protozoa classify according to their motion ?

الاسبوع الرابع والخامس

الاختبار القبلي (pre test)

-What are morphology of Entameba histolytica?

– What is Entameba histoltyica stages ?

Entamoeba histolytica

(Pathogenic Amoeba) - Causes dysentery and affects the large intestine. - Found in the human colon, especially cecum, rectum, and sometimes liver or lungs (extra-intestinal amoebiasis). - Irregular shape, 10-40 μ in size.

Trophozoite Stage: - Active, feeding stage. - Motility: Progressive, eruptive (amoeboid motion). - Cytoplasm: Differentiated into ectoplasm and endoplasm. - Pseudopodia: Finger-like projections. - Nucleus: Spherical with central karyosome. –

Divides by binary fission every 8 hours. - Not infectious in this stage.

Precyst Stage: - Non-motile, non-feeding. - Shape: Oval or spherical, 10-20 µm. - Begins encystment in intestinal lumen.

Cyst Stage: - Infectious stage. - Shape: Spherical, 10-15 µm.

Uninucleate cyst: 1 nucleus, glycogen, 1-4 chromatoid bodies (cigar-shaped).

Binucleate cyst: Glycogen and chromatoid bodies start disappearing.

Quadrinucleate cyst: Mature cyst with 4 nuclei, no chromatoid bodies.
Pathogenicity (Intestinal Amoebiasis):

Incubation: 1-4 weeks.

Forms:

Amoebic dysentery: Bloody diarrhea, abdominal pain, fever, weight loss.

Amoebic appendicitis: Acute lower abdominal pain.

Amoeboma: Palpable abdominal mass.

Fulminant colitis: Severe pain, rectal tenesmus, fever, nausea, hypotension.
Life Cycle of *Entamoeba histolytica*:

Infection: Ingestion of quadrinucleate cysts from contaminated food/water.

Cysts pass stomach unaltered.

Excystation occurs in caecum/ileum, forming trophozoites.

Trophozoites multiply and invade large intestine.

Some transform back into cysts, excreted with feces. Diagnosis:

Direct stool examination for trophozoites and cysts.

Observation of motility under microscope-

Q\what is Entameba histolytica infective stage ?

Q\what is Entameba histolytica disease?

Q\what is Entameba coli habtaut?

Q\what is Entameba coli movement ?

Entamoeba coli

Habitat = large intestine

The life cycle is similar to *E. histolytica*

-It has also three forms—trophozoites, precyst and cyst

- It is frequently found in the stool samples

The differentiated from that of *E. histolytica*

Trophozoite is largest *Cyst have 8 nucleaus*

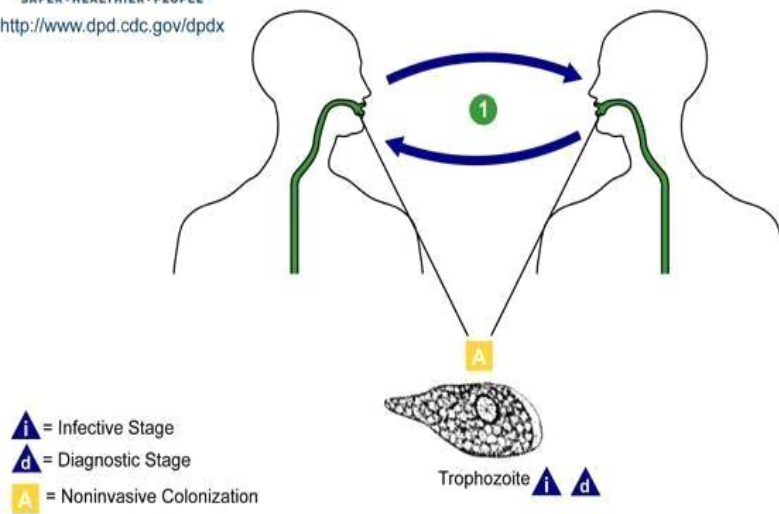
Diagnosis:- depends on seeing trophozoites and cyst stage of

Entamoeba coli in stool examination.

Entamoeba gingivalis

Habitat = lives in the mouth in the gingival tissues (pockets between the gum and teeth, in unhygienic mouth

Stage = only trophozoite stage is present no cystic stage.



.Trophozoite only:-

- *- Actively motile with multiple pseudopodia which is long (15-20)
- *-The cytoplasm contains food vacuoles with ingested bacteria and debris (leucocytes and epithelial cells).
- *- It's transmitted by direct oral contact throw droplet of saliva.

Diagnosis:- by taking swab from carious teeth in the gum and mix with drop of normal saline on slide, put cover slide and examin the motility of trophozoite

الاختبار البعدي

Q\what is Entameba gingvilis habtati?

Q\what is Entameba coli stage

Q\what is similiar E coli Ehistolytica ?

الاسبوع السابع والثامن

الاختبار القبلي

Q\classified mastigophora ?

Q\what is Giardia limbila habtat?

Q\what infective stage of Trichomonas hominis?

Mastigophora

***Flagellate**

Protozoa which possess whip-like flagella as their organs of locomotion

Flagellates are classified to

A- Intestinal flagellates.

B- Genital flagellates.

C- Oral flagellates.

D- Blood and tissue flagellates (Haemoflagellates).

Giardia . lamblia

***Habitat**

lumen or upper part of the small intestine (duodenum, jejunum).

***morphology**

It occurs in two forms—(1) trophozoite and (2) cyst

trophozoite

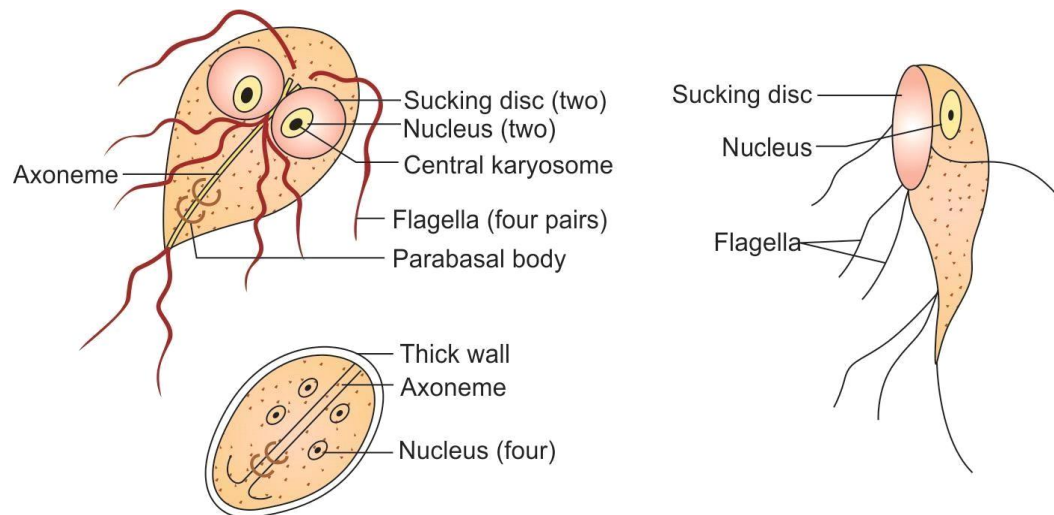
Pear shape round anteriorly and pointed posteriorly (or tear drop or tennis racket shaped) The trophozoite has a falling leaflike motility, usually 10–20 µm in length and 5–15 µm in width,

It's bilaterally symmetrical, Has 8 flagella in (4 pairs), arising from a complex system (blepharoblast) Has two nuclei with central karyosome lie in the area of the sucking disk in the anterior portion of the body, one on either side of the midline.

Convex dorsally & concave ventrally Divided by longitudinal binary fission.

The cyst

It's ovoid, about 8-14 μ by 7-10 μ in size and surrounded by a tough hyaline cyst wall. Clear axostyle in the middle. The young cyst has 2 nuclei and the mature cyst has 4 nuclei situated at one end, this is (infective stage) of *Giardia*.



Giardia completes its life cycle in one host, acquires infection by ingestion of food and water contaminated with mature cysts. Two trophozoites are released from each cyst in the duodenum within 30 minutes of entry. Trophozoites multiply by longitudinal binary fission in the Duodenum. Trophozoites adhere to the duodenal mucosa by the bilobed adhesive ventral disc. This is achieved by the microtubules of median bodies, contractile proteins present on the surface of adhesive disc that bind to the intestinal receptors. In active stage of the disease, the trophozoites are excreted in stool, when the trophozoites pass down to large intestine, encystation begins.



symptoms of giardiasis usually occur within 7 to 14 days of exposure to the parasite, although symptoms may appear as early as 3 days or as late as 25 days. They frequently include diarrhea, pale greasy stools (steatorrhea), stomach cramps, nausea, vomiting, bloating, weight loss, and weakness. Attachment of *Giardia* to the intestinal mucosa by sucking disk or (adhesive disc) may produce a considerable degree of mechanical irritation to the tissues.

****Diagnosis:-***

1- Is made by the examination of stool (GSE) for detect *Giardia lamblia*. trophozoite and cyst of

2- Immunological and serological tests like ELISA and other tests for detection of *Giardia lamblia* antigens in feces.

***Habitat**

in the large intestine in Ileum, cecum and colon

Pathogenicity.

non-pathogenic.

Stages

trophozoite only no cyst stage.

Morphology of Trophozoite

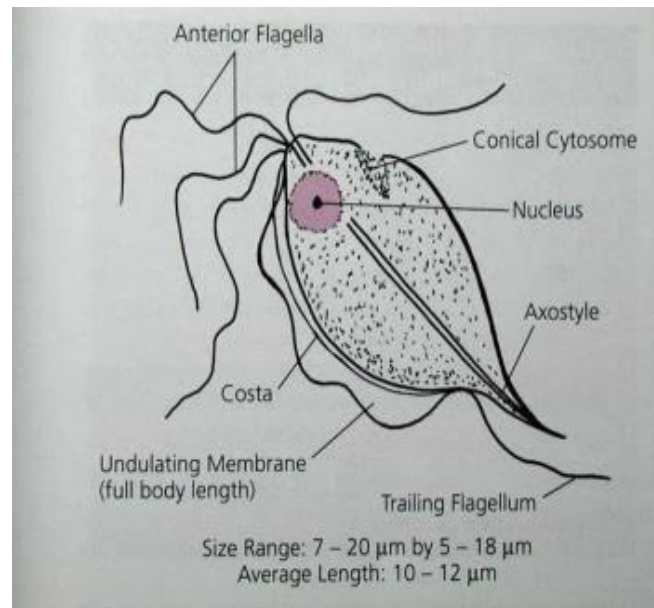
Pear shaped, rounded anteriorly and pointed posteriorly 7-15 μ in length, four equal free flagella anteriorly, the fifth trails free posteriorly along the undulating membrane which reaches to the posterior end of the body. Axostyle found in the center and projects beyond the posterior end as a small spine. The single nucleus lies near the anterior end of the cell.

***Motility:-** is jerky movement, rapid motion or rotating.

***Mode of infection**

by taking contaminated food or water with trophozoite of *Trichomonas hominis*.

***Diagnosis:** By finding trophozoite (active organism) of *Trichomonas hominis* in stool examination (GSE).



Trichomonas . tenax

Habitat : in the mouth (pockets between the teeth and gum).

Pathogenicity : non-pathogenic.

Stages : trophozoite only no cyst.

***Trophozoite**

trophozoite is smaller 5-10 μ , pear shaped. Has Four free flagella of equal backwards along the length arise from the anterior end the fifth passes margin of the undulating membrane .

The undulating membrane is shorter than the body. The axostyle is slender and the single nucleus is ovoid.

Mode of infection:-by direct contact, kissing, salivary droplets and fomites

Motility: gliding motion.

Diagnosis:- by finding the parasite *Trichomonas tenax* in the scrap taken from the gingival tissues.

Trichomonas. vaginalis

***Habitat:**

it lives in the genital tract of both female and male. In vagina and cervix in female, while in urethra, epididymis and prostate in male.

***Stages:**

trophozoite only no cyst stage

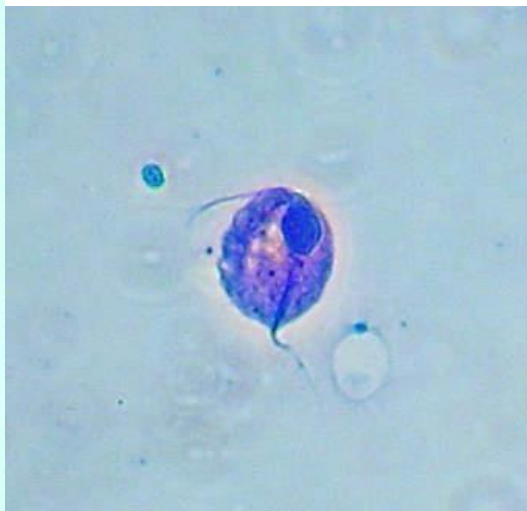
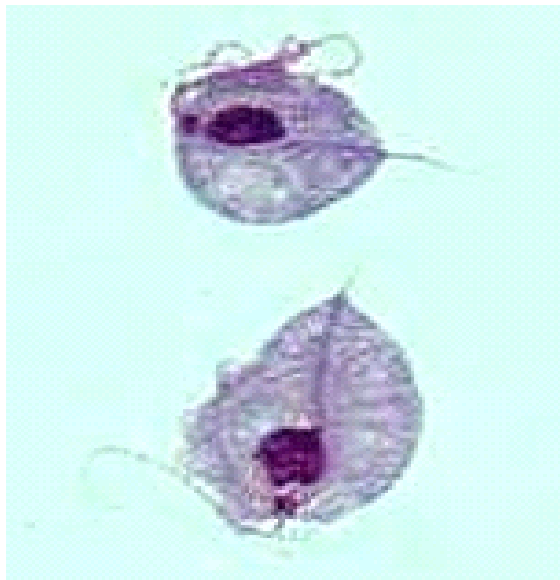
***Trophozoite**

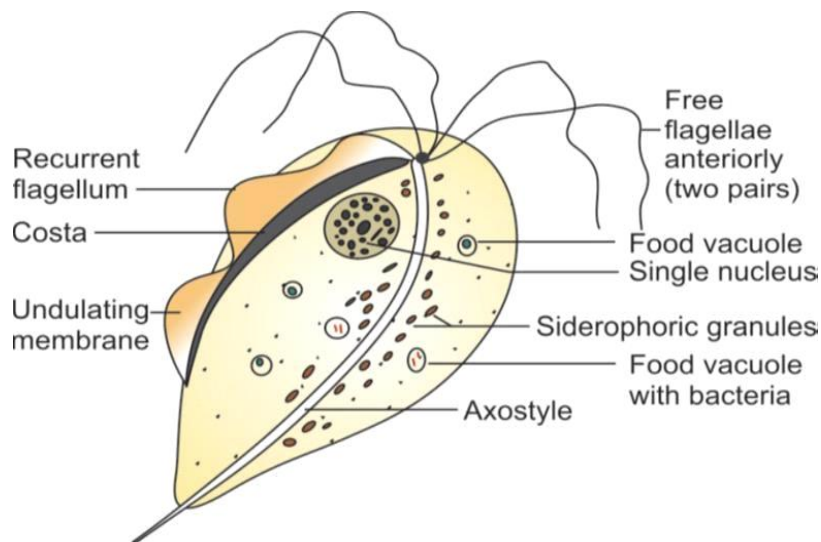
- Ovoid or pear-shaped about 10-30 μ long and 5-10 μ broad. Four free flagella of equal length arise from the anterior end, the fifth passes backwards along the margin of the undulating

membrane, Undulating membrane extends to the middle of the body. Has cells and food vacuoles which contain bacteria, starch and sometimes RBCs.

Has no free flagellum at the posterior end. Multiplication (divides) by longitudinal binary fission Nucleus is elongated with its chromatin evenly distributed in fine granules.

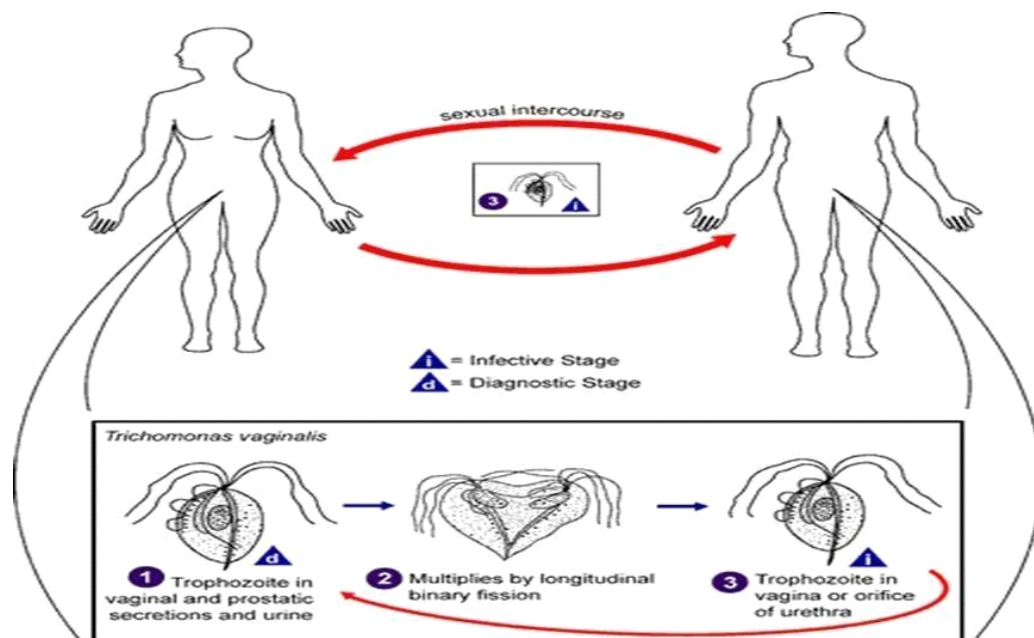
Motility : called gliding motion





Mode of infection: In the majority of cases the parasite is transmitted during (sexual intercourse), the male acting as a carrier.

Trophozoites are the infective stage, Asymptomatic females are the reservoir of infection and transmit the disease by sexual route. Trophozoites divide by longitudinal binary fission giving rise to a number of daughter trophozoites in the urogenital tract which can infect other individuals.



Pathogenicity causes Trichomoniasis or (Trichomonas vaginitis) in females it may produce offensive, yellowish, often frothy discharge.

In males it may

produce urethritis, prostatitis.

Diagnosis

by finding the parasite *Trichomonas vaginalis* in sediment urine (GUE).

by fresh swab from vaginal secretion.

by semen and prostate secretion of the male.

الاختبار البعدي

Q/What are type of Trichomonas

Q/What is Trichomonas Tenax habta ?

الاسبوع التاسع والعاشر

الاختبار القبلي

Q\classified Leishmania ?

Q\what are stage of blood and tissue ?

Haemoflagellates Leishmania &Trypanosoma.

Some haemoflagellates occur in four forms (morphological forms or developmental stages)

The body is round or ovoid with Amastigote (Leishmania stage):
out external flagellum, 2 – 4 μ in size, the nucleus, kinetoplast and
axial filament (axoneme) can be seen. this stage found (intracellular)
in vertebrate host reproduction by binary fission, non motile.

Promastigote (Leptomonas form):

The cell is elongated, kinetoplast is anterior to the nucleus near the
anterior and there is free flagellum but no undulating membrane, motile
by free flagellum, live (extracellular), this is the (infective stage) of
Leishmania ,the insect vector (invertebrates) and in culture media.
reproduction by simple longitudinal fission.

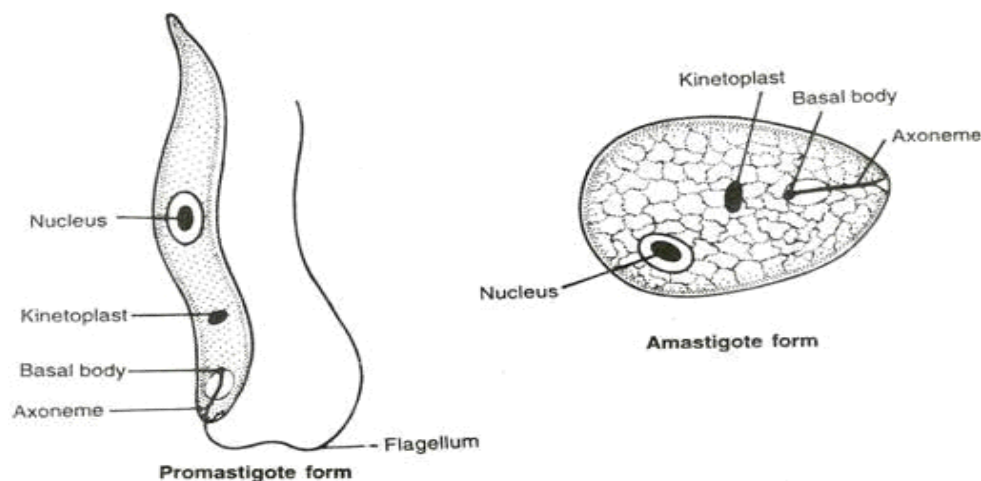


Fig. 178. Morphological forms of *Leishmania donovani*

Epimastigote (Crithidal form):

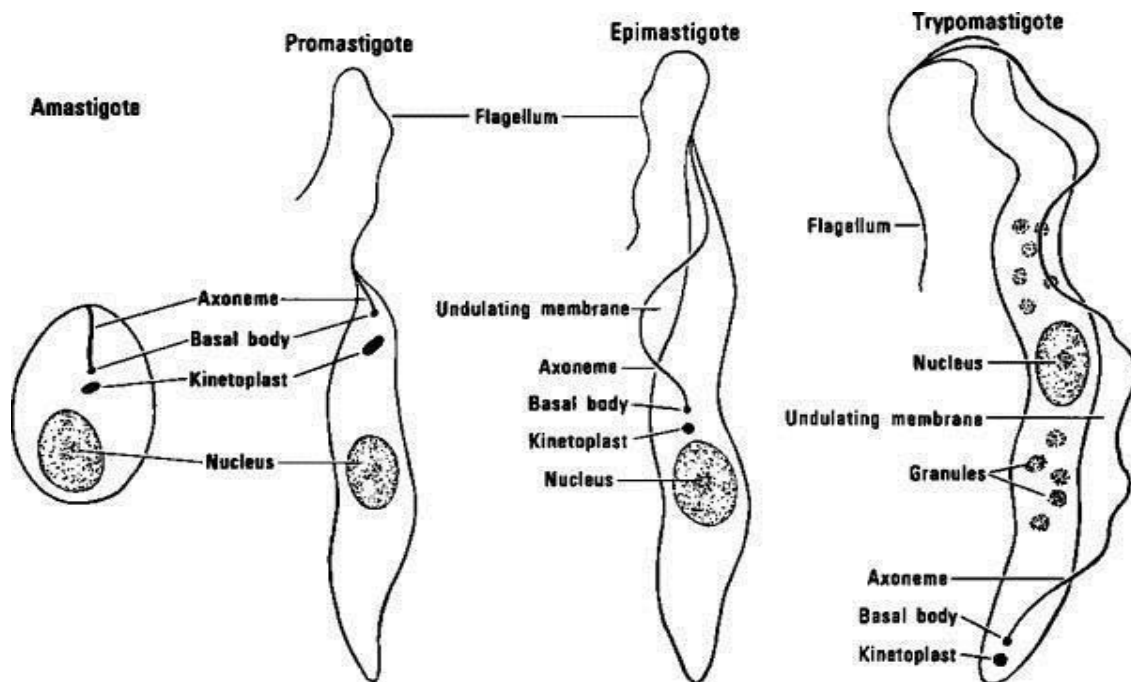
This form is more elongated, the kinetoplast placed more posteriorly in
front of the nucleus, the flagellum runs alongside the body as a short
undulating membrane before emerging from the anterior end as a (free
flagellum). This stage is lacking in leishmania.

.

Trypomastigote (Trypanosoma form):

The cell is more elongated, spindle shape with a central nucleus and the
kinetoplast posterior to the nucleus (post nuclear kintoplast) situated at
the posterior end. The flagellum runs alongside the entire length of the cell
to form along undulating membrane before emerging from the anterior
end , this stage found in the blood of the

infected vertebrate therefore called (blood forms). In the gut of the insect It becomes (metacyclic trypomastigote) which is infective stage to man.



The major parasitic species of Leishmania are :

Leishmania . donovani

Leishmania . tropica

Leishmania . braziliensis

***This genus passed by two stage in the life cycle:**

- Amastigote form: Round to oval, lacks flagellum, found in reticuloendothelial cells of man infected with Leishmania

- **Promastigote form:** Lanceolate shaped; kinetoplast is anterior to nucleus, Flagellum arises from the anterior end. It is found in the mid gut of insect vector (sand fly). This is the infective stage of Leishmania to man.

HostVector (intermediate): Sand fly genus (phlebotomus . papatasi

Final host :is vertebrates (man)

Habitat

***Amastigote form:** (intracellular) found in the cytoplasm of macrophages cells of spleen , liver and bone marrow and multiply there

)vertebrates)

***Promastigote form** :(extracellular): found in insect gut or in meid

)culture, its infective stage for man (vertebrates)

***Vector:**

Sand fly genus phlebotomus.

***Disease:-**

Visceral leishmaniasis, kala-azar, fever, Black fever

.)Post kala-azar dermal leishmaniasis (PKDL)

Amastigote form (intracellular)

*Promastigote form (extracellular(

Pathogenesis and symptomatology

Incubation period ranges from 2–6 months.

Lymphadenopathy

Hepatomegaly

Leucopenia

Secondary infections

*(Fever)

*)Splenomegaly

* (Anemia)

Diagnosis

direct methods\

by detect the clinical case of patient by doctor.

direct microscopic test: by taking material like peripheral blood, bone marrow aspiration, splenic and liver aspiration on clean slide, fix alcohol and stained by Giemsa stain to see the amastigote in with methyl macrophages.

culture on NNN medium to see promastigote.

-indirect methods:- a-immunological test : specific antibodies to Leishmania can be demonstrated by the fluorescent antibody test and indirect haemagglutination test.

biopsy tissues : the most useful tissue is bone marrow or the spleen animal inoculation.

Habitat:

Amastigote form: present in the skin only (intracellular) of reticuloendothelial cells of the skin.

Incubation period is 2-6 months, but may be shorter as short as 2 weeks or may be longer as long as 3 years ,Oriental sore usually occurs on face and handsIt begins as papule, becomes nodular and finally it ulcerates,The margins of the ulcers are raised, painless and indurated esions may be single or multiple and vary in size from 0.5 cm to more than 3 cm Mostly, it heals spontaneously leaving behind a scar .

Promastigote form:(extracellular): occurs in insect gut or in culture, its infective stage for man and vertebrate host.

Vector: Sand fly genus phlebotomus.

***Disease:-**Baghdad boil, Alebo boil, Delhi boil, Tropica sore, Oriental sore,Cutaneous leishmaniasis. It causes 2 types of lesions:

Leishmania tropica major (wet- type lesion).

Leishmania tropica minor (dry- type lesion).

Most Cutaneous lesion heal spontaneously.

Pathogenesis and symptomatology

*Diagnosis:-

- 1- By identification of the amastigote form in material obtained by puncturing the edges of the boil or scraping from boil and stained with leishman's or Giemsa stain.
- 2- Culture may be obtained in (NNN agar= Nicolle- NovyMacNeal agar).

*Habitat:

in the reticulo-endothelial system of the mucus membrane of the mouth, nose and throat.

*Disease:-

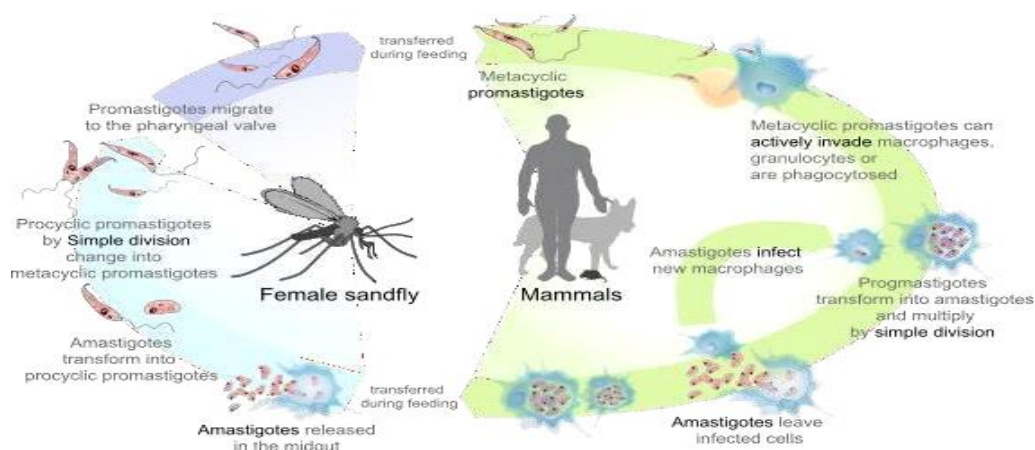
American leishmaniasis , Mucocutaneous leishmaniasis. Also called:

- Chiclero's disease ,
- Uta sore (similar to oriental sore) 3
- Espundia.

Causes ulceration of mucus membrane with destruction of bone and cartilage of nose and mouth.

*Diagnosis:

- by discovery the amastigote form of *Leishmania braziliensis* as in *Leishmania tropica*.



الاختبار البعدي

Q\diagnosis Leishmania spp?

Q\what is Leishmania donovani habitat ?

Q\choose the correct

infective stage of Leishmania tropica is

a-amastigote b- promastigote c-trypomastigote

الاسبوع الحادي عشر والثاني عشر

الاختبار القبلي

Q\what is type of Trypanosoma ?

Q\what are Trypanosoma spp habitats ?

Trypanosoma . gambiense

Trypanosoma . rhodesiense

Trypanosoma . cruzi

Classified to:-

stage (metacyclic trypanosomes: The infective Stercorarian

trypomastigote) found in hind-gut of the insect, Infection occurs when

the parasite leaks from the insect's stools into the skin during feeding on human blood .ex: Trypanosome cruzi.

Salivarian trypanosomes: The infective stage (metacyclic trypomastigote) found in the front gut of the insect, the infection transmitted with the saliva of the insect to the blood stream. ex: Trypanosome brucei, T. gambiense, T. rhodesiense.

Disease:- Gambians trypanosomiasis , mid & west African sleeping sickness.

Vector host : tse tse fly (Glossina. Palpalis)

Habitat

: in the blood stream ,lymphatic node.cerebrospinal fluid.brain

Infective form: The metacyclic trypomastigote

By the bite of tse tse Mode of transmission

Life cycle passes its life cycle in two hosts. The vertebrate host is human and other

animals Invertebrate host is the tsetse fly (genus Glossina)

) (Glossina

Infection with Trypanosoma species exhibits 3 stages

Stage 1:- after bite the fly causes local inflammation the parasite beroids its (1-2) week.

Stage 2- may cause fever, headaches, joint pain, weakness and itching Over time as the trypomastigotes infect the central nervous system, the symptoms include headaches, Enlargement of the lymphatic glands (especially in the posterior triangle of the neck) called (Winterbottom sign, not as common in rhodesiense infection

Stage 3 -In later stages of infection parasites pass the blood brain barrier and infect the CNS Presence of parasites leads to meningo- encephalitis, which ultimately ends in coma (sleeping sickness, abnormal behavior, and lethargy, and finally unconsciousness

death before coma

Diagnosis: by:-

**1-direct microscopy by stained or unstained preparation.*

**2-demonstration of Trypanosomes in blood, bone marrow, CSF, Lymph nodes.*

**3-Animal inoculation.*

**4-Culture methods.*

**5-Serological tests:*

a-Indirect Fluorescent Antibody Test (IFAT). b-Complement Fixation Test(CFT).

Disease:- *Rhodesian trypanosomiasis, East African sleeping sickness*

Vector host :-*tse tse flies ,Glossina palpalis.*

Habitat: *in the blood stream ,lymphatic node.cerebrospinal fluid.brain*

Life cycle& symbiosis (Like the Tgambiense)

****Disease :*** *American trypanosomiasis or Chagas' disease.*

****Vector host***

reduviid bug)

****Habitat :***

T. cruzi exists in two forms: In humans

A) Amastigote:-live in muscular tissue, nervous tissue and in the reticuloendothelial system , multiplication

cells. inside

(B) Trypomastigote:- seen in peripheral blood which takes C or U shape about 20 μ and it has large kinetoplast in the posterior end, no multiplication in human blood U,C .

Epimastigote and metacyclic trypomastigote: occur in the mid insect. of gut hind and

Geographical distribution:- in central and south America.

Host :-it has 2 hosts :-

invertebrate host :-

Reduviid bug (Vector) as an intermediate host ,

Vertebrate host :- human or reservoir host.

Mode of infection:-

1- by insect bite and the metacyclic trypomastigote enter the skin

it. on defecate insect the when

2- T. cruzi can also be transmitted by the blood transfusion, organ transplantation from mother to fetus or very rarely by ingestion of contaminated food or drink, and most importantly by laboratory accidents.

الاختبار البعدي

Q/ What is intermidte host of Trypansoma spp?

Q\What are Trypansoma stage ?

الاسبوع الثالث عشر

الاختبار القبلي

Q\classfeid plasmodum ?

Q\where are plasmodum habtaif?

Class : Telospora (Sporozoa)

This is the parasite causative of disease called (Malaria) air bad (means it Malaria

There are four species of malaria and its diseases:

*1-Plasmodium vivax : Causes benign tertian malaria, Paroxysm (every 48 hrs).

*2-Plasmodium ovale : Causes Ovale tertian malaria. Paroxysm (every 48 hrs).

*3- Plasmodium Malariae : Cause quartan malaria, Paroxysm (every 72 hrs)

*4- Plasmodium falciparum ; cause pernicious malaria or tetan malaria

which is the severest form of malaria and responsible for nearly all fatal cases

intermediate host : human

Vector and final host : female anopheles mosquito..

Infective form: The sporozoites (It enters the bloodstream with the insect's saliva and

liver (the way it finds

Habitat...

cells of liver and red blood cells of vertebrates during Schizogony.

in the bodies of *anopheles mosquitoes* during the Sporogony.

Paroxysm :- bout of fever dueing to the liberation of merozoites during the erythrocytic

Cold stage :- lasting for 15 to 60 minutes (rigor, headache , fever).'

fever stage:- lasting for 2 to 6 hours , high fever to (41C°) or higher , severe headache , nausea and vomiting .

Sweating stage :- lasting for 1- 2 hours, temperature

perspiration , pain and headache disappear, the patient usually falls into deep sleep .

Fever type

Black water fever (Malarial hemoglobinuria): Caused by *Plasmodium falciparum* , passage of dark red or blackish urine (black water).

Malaria relapses : is the appearance of the parasite in the bloodstream that leads to the emergence of symptoms of malaria as a result of the merozoites invading time. later a at again cells blood

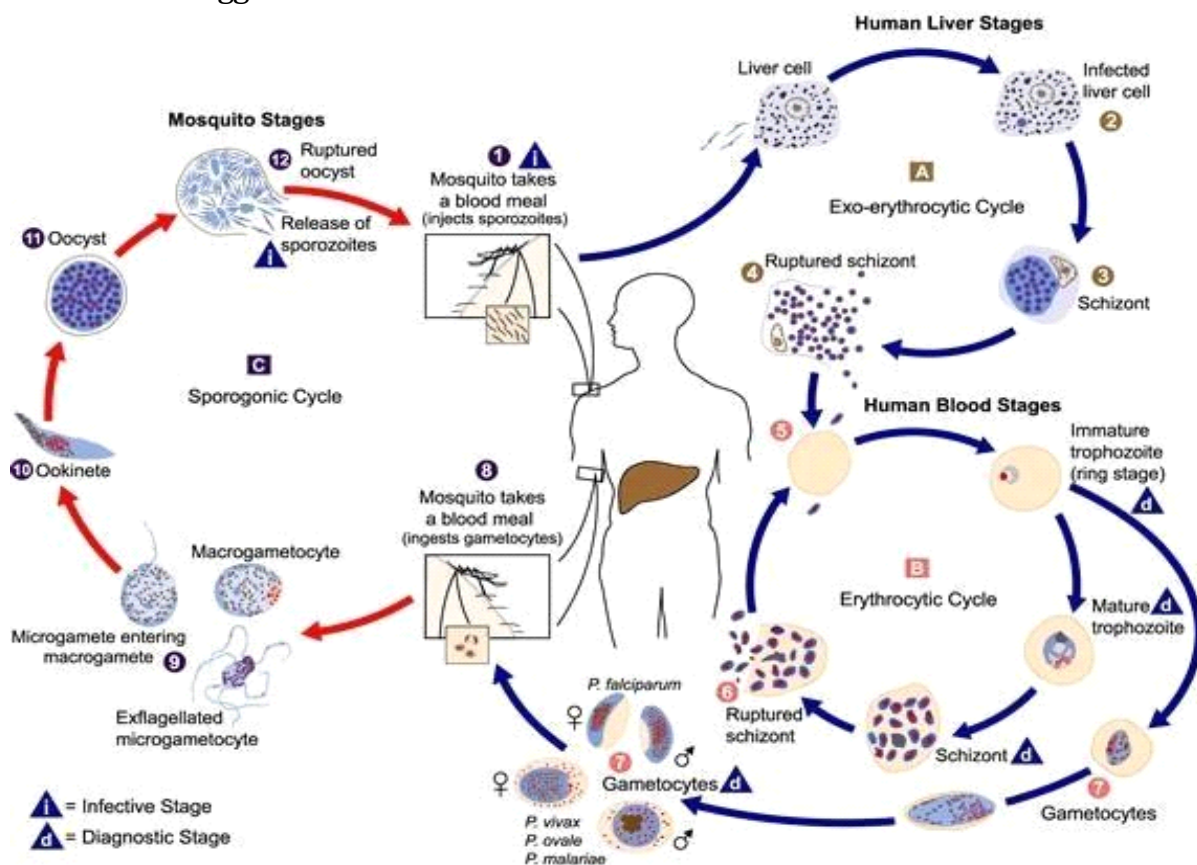
. Diagnosis :

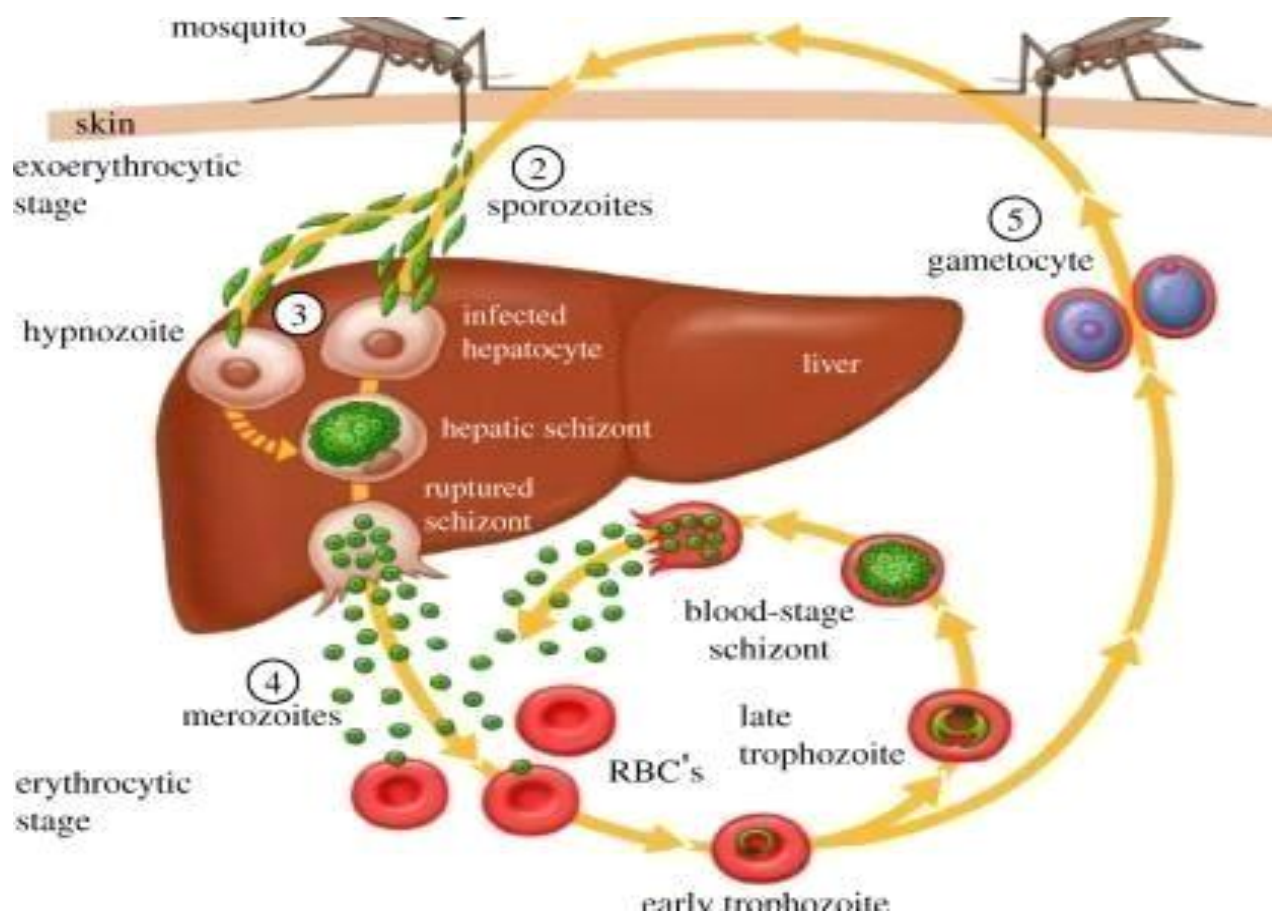
1- by finding the blood stages of malarial parasite like (ring stage, schizonts, microgametocyte and macrogametocyte) in microscope examination of blood film (thick and thin blood film).

2- Immunological tests:-

indirect fluorescent antibodies test .

indirect agglutination test.





Life cycle in *liver*

Comparison of the characteristics of plasmodia infected man

	characters	<i>P.vivax</i>	<i>P.falciparum</i>	<i>P.malaria</i>	<i>P.ovale</i>
1	stages found in blood	Trophozoites, schizonts and gametocytes	Only ring and gametocytes.	Trophozoit, schizonts and Gametocytes	Only ring and gametocytes
2	ring stage	, Large m 2.5 usually single , prominent Chromatin .	Delicate , small 1.5m , double chromatin and multiple rings common .	Simillar to vivax but thicker.	Similar to vivax ,more compact.
3	schizonte	Large, filling red cell	Small compact seldom seen in blood smear		Medium size
4	number of mirozoites	12-24 in irregular grape like cluster	in 8-24 grape like cluster	6-12 in rosette pattern .	6-12 irregularly arranged .
5	microgameto cyte	Spherical , compact pale blue cytoplasm diffuse nucleus	Sausage – shape pale blue or pink cytoplasm , large diffuse nucleus.	As in vivax	As in vivax

6	macrogameto cyte	Large spherical deep blue cytoplasm compact nucleus.	Crescentic , deep blue cytoplasm compact nucleus.	As in vivax	As in vivax
7	infected erythrocyte and stippling	Enlarged , pale with schuffners dots.	Normal size , maurers clefts sometimes basophilic stippling	Normal , occasionally ziemanns stippling .	Enlarged oval fimbriated prominent schuffner's dots.

الاسبوع الرابع عشر والخامس عشر

الاختبار القبلي

Q\what is Toxoplasma gondii habtaut?

Q\classified Toxoplasma gondii ?

Toxoplasma gondii

obligate intracellular parasite, world wide in distribution especially in hot climate infect birds , reptiles , mammals and human .

PLASMA = FORM and The name consist of TOXON = Bow

Disease Toxoplasmosis

*..**Final host** : The cat

*..**Intermidate host**:-human and some mamaleis like bird ,mouse ,sheep

*..**Habitate** :- organs like brain, skeletal and cardiac muscles, eye, liver, lymph node

*... **Morphology**

It exists in five morphological forms—two asexual forms (tachyzoite and bradyzoite) in intermediate host (human) and sexual form (oocyst , Schizont, gametocyte) in the final host the cat

Five phases or stages of T.gondii are available, These are:

Tachyzoites (in blood).

Bradyzoites(inside tissue cysts)

(**Oocysts**) contints 2 sporocyst ,every one have 4 sporozoite

Schizont \ divided into a large number of merozoite

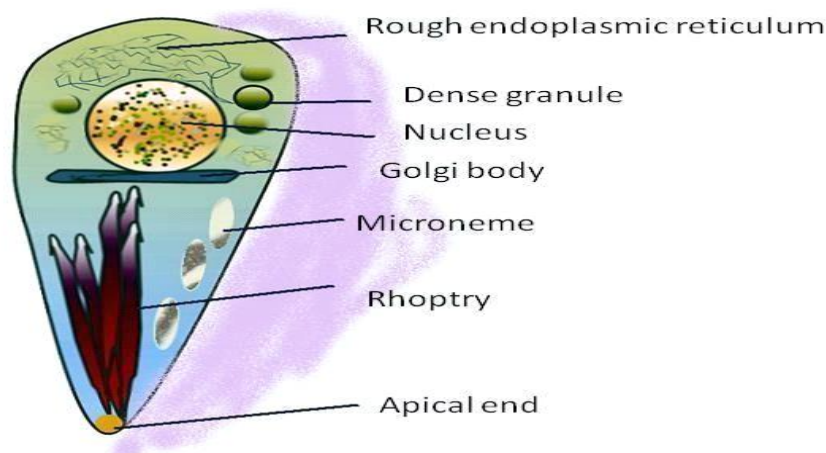
gametocyte: divided into male microgametocyte and female of macrogametocyte

Tachyzoites: It means (Tachos=Speed in Greek) . To describe the stage of quick division in any cell of the intermediate host and cells of the final host .

- except the squamous epithelial cells

Tachyzoites also called endodyozoites or endozoites . The shape is crescent, rounded from one end and tapering from the other The nucleus situated in the middle of the cell and containing chromatin dots and nucleolus in the centre. They can infect all mammalian (nucleated) cells except red blood cells (RBCs), divide asexually by a process called as internal budding or endodyogeny ,she move without the presence of cilia, flagella or psoudopods, It moves by the rounded movement and the

- flexibility of the cells

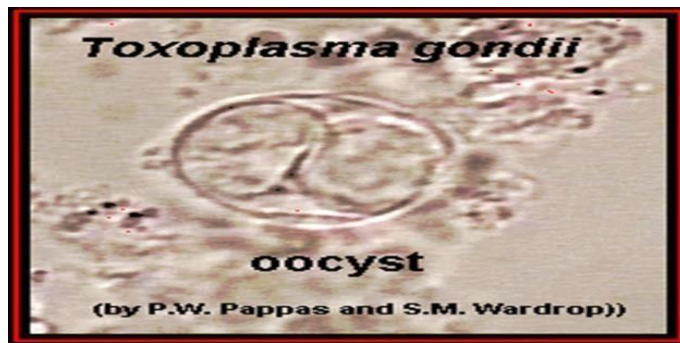


cysts:

The name Bradyzoite mean (brady = slowin Greek) , to describe the microbes that reproduced slowly inside tissue cysts.The bradyzoites are also called cystizites. The tissue cysts are growing inside cells and containing the bradyzoites which reproduced also by endodyogony. cysts are growing in the visceral organs, they are most familiar in the muscular system and the nervous tissues (brain, eye, skeletal muscles and heart). harmless, causing no signs and symptoms The cysts are

3 -The Oocyst

Each cyst contains 2 sporocysts. each of these sporocysts containing 4 sporozoites



Transmission to man occurs by:

-Ingestion of sporulated oocysts

(infective form) from contaminated soil ,food, or water (most common route)

Ingestion of tissue cyst containing bradyzoites (infective form) from undercooked meat

injuries, organ transplantation, By blood transfusion, needle stick transplacental transmission or laboratory accidents.

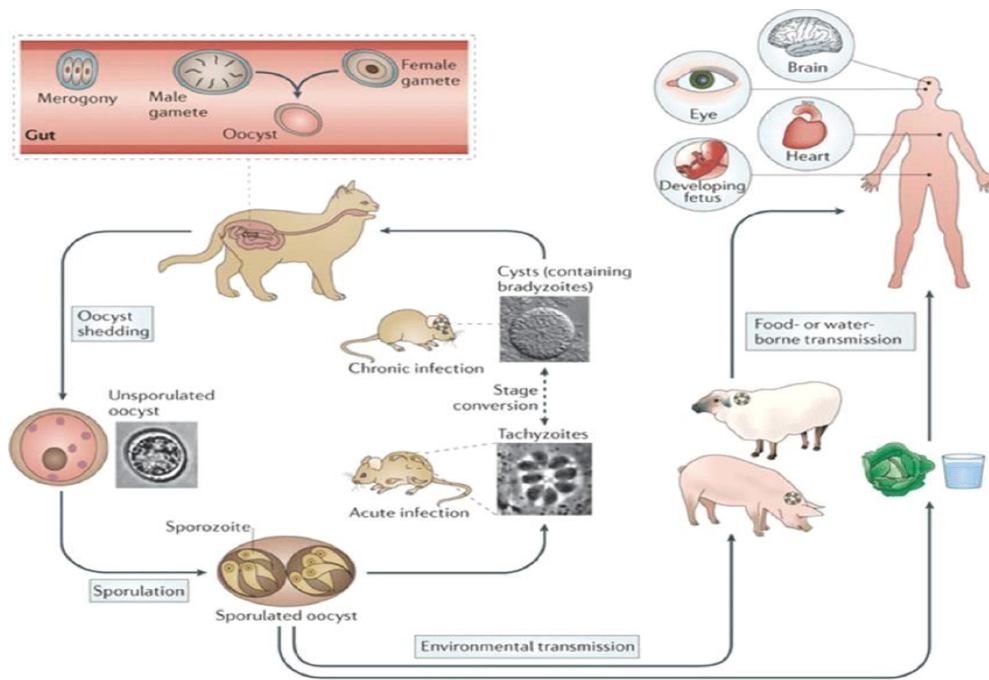
Tachyzoites are the infective stage

Life cycle:

The life cycle involves two hosts:

Definitive hosts are cat Intestinal stage (sexual stage)—In cat called enter epithelial cycle.

Intermediate hosts are man and other mammals (goat, sheep, pig, mouse, cattle and certain birds); where the asexual cycle inside the host (intermediate) called extra intestinal cycle.



life cycle toxoplasma

Pathogenicity:

****1 -Acquired Toxoplasmosis:**

Acquired disease symptoms appear in males and non-pregnant women and are transmitted in all ways except the placenta may be transmitted with food contaminated, organ transplantation and blood transfusion.

*** * 2 -Congenital toxoplasmosis:**

It is transmitted through the placenta from mother to child when pregnant women infected parasite during the first months of pregnancy and may not show symptoms on the pregnant mother while the fetus is affected by the arrival of parasite through the placenta and result in abortion Abortion , either caused by the incidence of toxoplasmosis in the months of late pregnancy, The child is deformed or dies

immediately after childbirth and causes hydrocephalitis and calcification within the brain , blindness and inflammation, encephalitis, ental retardation, seizures , and deat

Diagnosis

laboratory diagnosis may be made by the microscopic examination of impression smears of lymph nodes , bone marrow , brain and liver , which stained with (giemsa stain

) to see the (Tachyzoites) and tissue cysts (contains bradyzoites).

Isolation may be made by using laboratory animals like (rats and mice).

Immunological testes include :-

Sabin – Feldman dye test .

Indirect fluorescent antibody test(IFAT).

Indirect hemogglutination test (IHAT).

Latex agglutination test (LAT).

ELISA (Enzyme Linked Immunosorbant Assay .

ELISA- IgG and ELISA- IgM

. Class = Ciliate

Balantidium coli

The largest protozoan parasite of man, its prevalence is very low. The body is covered with

cilia which are hair-like processes shorter than flagella but more in number.

Habitat:- in large intestine of man.

Disease:- Balantidial dysentery or Balantidiasis. Produce mucosal ulcers as amoebiasis,

causes diarrhea with blood and mucus, abdominal colic, nausea, vomiting.

Morphology: has 2 Stages: trophozoite and cyst

A- Trophozoite:-

1- Large ovoid cell about 70 - 100 X 40 - 70 vacuoles, very large cell up to 200 μ .

2- The anterior end is narrow and the posterior end is broad.

3- There is a groove –inverted conical depression called peristome in the anterior end

leading to the mouth (cytostome).

4- Posteriorly there is a small anal pore (cytopyge)

5- The cell covered with cilia (locomotive organs.)

6 -The cell has two nuclei;

a-Macronucleus: large, kidney shape, responsible for cell functions.

b-Micronucleus:small, responsible for sexual reproduction

7- The cytoplasm has one or two contractile vacuoles and several food.

8- Multiplication by:

frequently.

Transverse binary fission. b-conjugation occurs in

B- : cyst

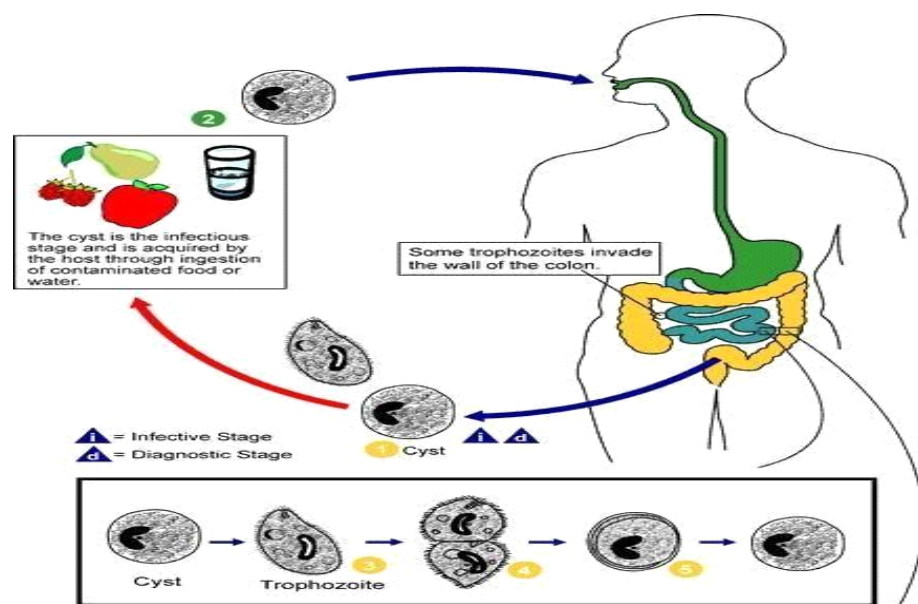
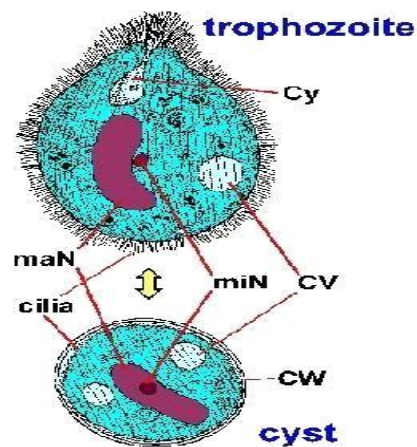
rounds up and secretes a tough cyst wall around it (encystations), 50 -60 μ in diameter , it

has the same morphology of Trophozoite but only the cilia and food vacuoles disappear. The

cyst born one Trophozoite only. the cyst is infective stage.

****Diagnosis**

: is established by demonstration the parasite *Balantidium coli* in feces, motile Trophozoite occur in diarrhoic faeces, cyst are found in formed stool. cyst aab
Macronucleus: large, kidney shape, responsible for cell functions. **Micronucleus:**small, responsible for sexual reproduction



الاختبار البعدي

Q\classified Balantidium coli ?

Q\ what is Balantidium coli habite ,stage?

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