

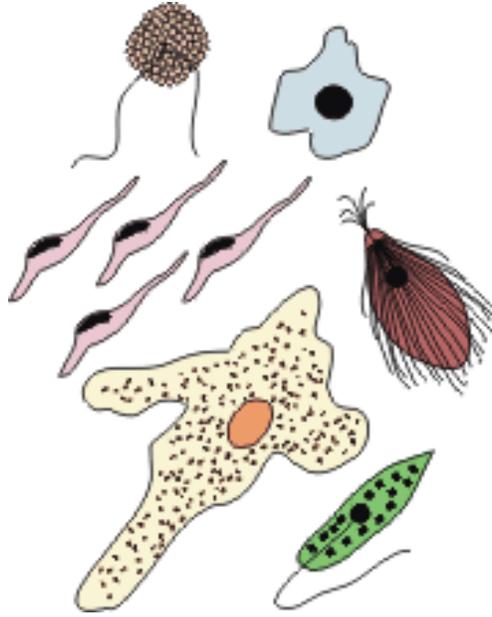
***First year Biology complete  
notes***

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**PROTOCTISTA**



# DR. ABDULLAH .G. ARIJO

**PROTOCTISTA:** A kingdoms of un-natural organisms which are first eukaryotic organisms

**GREEN ALGAE:** Plant like protista, which may be single cellular (Chlorella and Euglena) to multi-cellular (Ulva). They are responsible for 50% photosynthesis of world.



**CHLORELLA:**

A single cellular, eukaryotic non-motile, freshwater green algae, which has cup shape plastids and paranooids for storage for starch

**APLANOSPORE:**

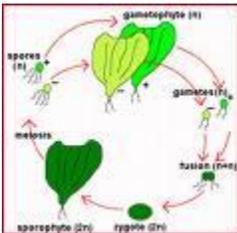
A type of asexual reproduction in chlorella in which chlorella enlarges its nucleus and divides protoplasm into 8-16 protoplasmic bodies. After rupture of cell, the small bodies are released and each becomes new chlorella.

**CHLORELLIN:**

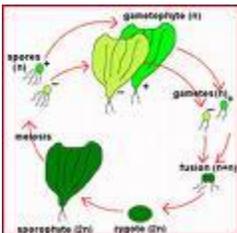
A chemical compound extracted from Chlorella and used in antibiotics.

**ULVA:**

A multi-cellular, marine green algae, which is found in coastal areas and is commonly called Sea Lettuce.



**ALTERNATION OF GENERATION:** A kind of reproduction in which one generation of organism reproduces asexually and other reproduce sexually.

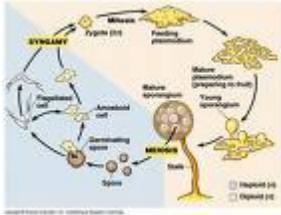
**ISOMORPHIC**

**ALTERNATION OF GENERATION:** A kind of alternation of generation, in which sporophytic and gametophytis plants look same morphologically but have different chromosomes number.

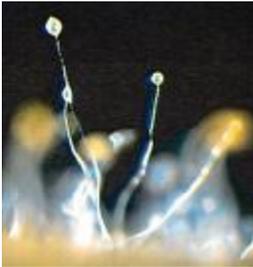
**OoMYCOTA:**

Fungi-like protista which are non-chlorophyllous. E.g. Plasmodial slime Mold and Water slime mold

**PLASMODIAL SLIME MOLD:** A fungi like protista which creeps on leaves and trees. It moves like Giant amoeba.



**FRUITING BODIES:** Reproductive structures made by plasmodial slime mold. Fruiting bodies have a small stalk and rounded capsule called sporangium, inside which spores are produced.



**PHYTOPHTHORA INFESTANT:** A species of water mold, which causes Late Blight of Potato. The disease erupted in Ireland during 1846 to 1847 and killed one million people.

**SYNGAMY:** Fusion of 2 gametes of opposite sex to form a zygote is called Syngamy

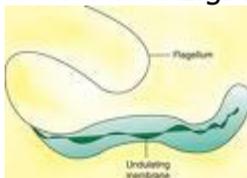
## PROTOZOA (85,000 species known)

### PROTOZOA

It refers to single cellular eukaryotic plants and animals

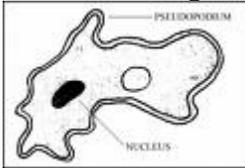
### CLASS FLAGELLATA

It includes single cellular plants and animals which have flagellum for locomotion. E.g. Euglena, Trypanosoma



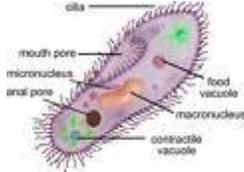
### CLAS SARCODINA

It includes organisms, which have pseudopodia for locomotion. E.g. Amoeba



### CLASS CILIATA

It includes organisms, which have cilia for locomotion. E.g. *Paramecium condatum* and *Balantidium coli*



### CLASS SUCTORIA

It includes organisms, which have cilia when juvenile and no cilia as adult. E.g. Acinata

### CLASS SPOROZOA

It includes organisms, which have no locomotary organs. E.g. Plasmodium

### SLEEPING SICKNESS

A blood disease caused by trypanosomes parasite



### AMOEBIC DYSENTRY

A disease caused by *Entamoeba histolytica*. In this disease there is great loss of water from body

### EUGLENA

A disputed single cellular organism. Basically it is a plant, but due to presence of plant-like and animal-like characters, it is considered as bridge between plants and animals

### PELLICLE

Since Euglena is without cell wall, its body is covered with pellicle, which is alternate of cell wall

### ASTAXANTHIN

An animal like pigment present in eye spot of Euglena

**EYE SPOT**

A spot present on the upper half of body. It has no lens, which is why it does not help in seeing

**MALARIA:**

Malaria is caused by a parasite called Plasmodium, which is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver, and then infect red blood cells. Symptoms of malaria include fever, headache, and vomiting, and usually appear between 10 and 15 days after the mosquito bite

**FEMALE ANOPHELES MOSQUITO**

Anopheles is a genus of mosquito. There are approximately 400 Anopheles species, of which 30-40 transmit four different species of parasites of the genus Plasmodium that cause malaria which affects humans

**Chloroquine:** A drug used against malaria. A very safe and inexpensive drug, its value has been compromised by the emergence of chloroquine-resistant malaria parasites

**Epidemiology:** The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems

**Erythrocyte:** A red blood cell.

**Erythrocytic stage:** A stage in the life cycle of the malaria parasite found in the red blood cells. Erythrocytic stage parasites cause the symptoms of malaria.

**Etiology:** The cause or origin of a disease or disorder; the study of the factors that cause disease and of the method of their introduction into the host.

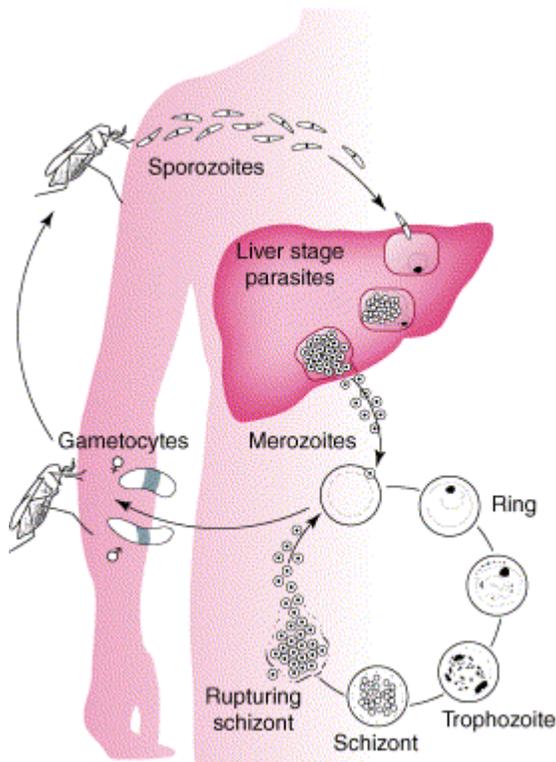
**Exoerythrocytic stage:** A stage in the life cycle of the malaria parasite found in liver cells (hepatocytes). Exoerythrocytic stage parasites do not cause symptoms.

**Gametocyte:** The sexual stage of malaria parasites. Male gametocytes (microgametocytes) and female gametocytes (macrogametocytes) are inside red

blood cells in the circulation. If they are ingested by a female *Anopheles* mosquito, they undergo sexual reproduction which starts the extrinsic (sporogonic) cycle of the parasite in the mosquito. Gametocytes of *Plasmodium falciparum* are typically banana or crescent-shaped (from the latin falcis=sickle).

**Hemoglobin:** The red, oxygen-carrying protein found in red blood cells.

**Hemolysis:** Destruction of red blood cells. Malaria causes hemolysis when the parasites rupture the red blood cells in which they have grown.



**Hepatocytes:** Liver cells.

**Hepatomegaly:** Enlarged liver.

**Hypoglycemia:** Low blood glucose. Hypoglycemia can occur in malaria. In addition, treatment with quinine and quinidine stimulate insulin secretion, reducing blood glucose

**Incubation period:** The interval of time between infection by a microorganism and the onset of the illness or the first symptoms of the illness. In malaria, the incubation is between the mosquito bite and the first symptoms. Incubation periods range from 7 to 40 days, depending on species.

**Leukocyte:** White blood cell.

**Leukocytosis:** Increase in total white blood cell count.

**Leukopenia:** Decrease in total white blood cell count.

**Merozoite:** A daughter-cell formed by asexual development in the life cycle of malaria parasites. Liver-stage and blood-stage malaria parasites develop into schizonts which contain many merozoites. When the schizonts are mature, they (and their host cells!) rupture; the merozoites are released and infect red blood cells.

**Mefloquine:** A drug used against malaria.

**Microgametocyte:** The male form of the gametocyte.

**Oocyst:** A stage in the life cycle of malaria parasites, oocysts are rounded cysts located in the outer wall of the stomach of mosquitoes. Sporozoites develop inside the oocysts. When mature, the oocysts rupture and release the sporozoites, which then migrate into the mosquito's salivary glands, ready for injection into the human host

**Parasitemia:** The presence of parasites in the blood. The term can also be used to express the quantity of parasites in the blood (e.g., "a parasitemia of 2%").

**Pathogen:** Bacteria, viruses, parasites or fungi can cause disease.

**Phagocyte:** A type of white blood cell that can engulf and destroy foreign organisms, cells and particles. Phagocytes are an important part of the immune system.

**Plasmodium:** The genus of the parasite that causes malaria. The genus includes four species that infect humans: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale* and *Plasmodium malariae*.

**Protozoan:** Single-celled organism that can perform all necessary functions of metabolism and reproduction. Some protozoa are free-living, while others, including malaria parasites, parasitize other organisms for their nutrients and life cycle.

**Quinine:** A drug used against malaria, obtained from the bark of the cinchona tree

**Schizogony:** Asexual reproductive stage of malaria parasites. In red blood cells, schizogony entails development of a single trophozoite into numerous merozoites. A similar process happens in infected liver cells.

**Schizont:** A developmental form of the malaria parasite that contains many merozoites. Schizonts are seen in the liver-stage and blood-stage parasites.

**Splenomegaly:** Enlargement of the spleen. Found in some malaria patients. Splenomegaly can be used to measure malaria endemicity during surveys (e.g., in communities or in schoolchildren).

**Sporozoite:** A stage in the life cycle of the malaria parasite. Sporozoites are produced in the mosquito and migrate to the mosquito's salivary glands. They can be inoculated into a human host when the mosquito takes a blood meal on the human. In the human, the sporozoites enter liver cells where they develop into the next stage of the malaria parasite life cycle (the liver stage or exo-erythrocytic stage).

**Trophozoite:** A developmental form during the blood stage of malaria parasites. After merozoites have invaded the red blood cell, they develop into trophozoites (sometimes, early trophozoites are called "rings" or "ring stage parasites"); trophozoites develop into schizonts

**Trophozoite:** A developmental form during the blood stage of malaria parasites. After merozoites have invaded the red blood cell, they develop into trophozoites (sometimes, early trophozoites are called "rings" or "ring stage parasites"); trophozoites develop into schizonts

## **PRACTICE SHEET**

### **KINGDOM PROTISTA QUIZ**

- 1. Many species of Protista contain chlorophyll and are autotrophic, so they are called**
  - a) Green algae
  - b) Blue green algae
  - c) Both a&b
  - d) d) None
- 2. Due to difference in nutrition, Protista are divided into**
  - a) Single celled algae and Protozoa
  - b) Protozoa and metazoa**
  - c) Unicellular and mono-cellular
- 3. Group of Protista organisms which are non-photosynthetic are called**
  - a) Protozoa
  - b) Protozoan
  - c) Both a&b

- d) None
- 4. Typical protozoan have single nucleus, but there may be 2 in**
- a) Paramecium
  - b) Acineta
  - c) Both a&b
  - d) None
- 5. One of the following are called ancestors of modern plants and animals**
- a) Ciliates
  - b) Flagellates
  - c) Suctorians
  - d) Sporozoans
- 6. One of the following is parasitic flagellata**
- a) Balantidium
  - b) Trypanosoma
  - c) Leishmania
  - d) None
- 7. The vector for Trypanosome are**
- a) Mosquitoes
  - b) Tsetse flies
  - c) House flies
  - d) None
- 8. One of the following is called colorless Euglena**
- a) Volvox
  - b) Peranema
  - c) Both a&b
  - d) None
- 9. One of the following causes dysentery**
- a) Amoeba
  - b) E. Histolytica
  - c) Both a&b
  - d) None
- 10. Following refers to the fossil zones formed by protozoa**
- a) Radiolaria
  - b) Globigerina
  - c) Both a&b
  - d) None
- 11. The locomotion in sarcodina is by**
- a) Pseudopodia
  - b) Cilia
  - c) Flagella
  - d) None
- 12. Euglena and trypanosoma are similar in having**
- a) Flagella

- b) Same feeding habit
  - c) Both a&b
  - d) None
- 13. One of the following does not belong to Ciliata**
- a) Paramecium
  - b) Balantidium
  - c) Apalina
  - d) Globigena
- 14. In ciliates, mostly reproduction is asexual, but two paramecium can do**
- a) Budding
  - b) Conjugation
  - c) Schizogony
  - d) Isogamy
- 15. One of the following are called relatives of suctoria**
- a) Flagellata
  - b) Ciliata
  - c) Sporozoa
  - d) None
- 16. The reproduction in Acineta is by**
- a) Fission
  - b) Budding
  - c) Gemmule formation
  - d) All
- 17. Plasmodium belongs to**
- a) Sporozoa
  - b) Ciliata
  - c) Sarcodina
  - d) None
- 18. The Monocysts are found in**
- a) Earthworm
  - b) Ell worm
  - c) Humans
  - d) Birds
- 19. One of the following are found in the intestine of poultry birds**
- a) Monocysts
  - b) Coccidia
  - c) Peranema
  - d) All
- 20 The Locomotion in Balantidium is by**
- a) Cilia
  - b) Flagella
  - c) Pseudopodia
  - d) None

**ANSWER KEY**

- |    |   |
|----|---|
| 1  | a |
| 2  | a |
| 3  | a |
| 4  | c |
| 5  | b |
| 6  | b |
| 7  | b |
| 8  | b |
| 9  | b |
| 10 | c |
| 11 | a |
| 12 | a |
| 13 | d |
| 14 | b |
| 15 | b |
| 16 | b |
| 17 | a |
| 18 | a |
| 19 | b |
| 20 | a |

**TEST-02****CHLORELLA**

1. One of the following is example of plant like protoctista
  - i. Algae
  - ii. Oomycota
  - iii. Protozoa
  - iv. All
2. One of the following is example of fungi like protoctista
  - i. Algae
  - ii. Oomycota
  - iii. Protozoa
  - iv. All
3. One of the following is example of protozoa like protoctista
  - i. Algae
  - ii. Oomycota
  - iii. Protozoa

- iv. All
4. Algae differ from plants being aquatic whereas plants are terrestrial
    - i. True
    - ii. False
  5. The algae may be single cellular, filamentous or multicellular. Their classification is done on the basis of
    - i. Pigments they contain
    - ii. Morphology
    - iii. Color
    - iv. None
  6. One of the following is freshwater algae found floating in stagnant water of ponds, pools and ditches
    - i. Agaricus
    - ii. Chlorella
    - iii. Sinella
    - iv. All
  7. One of the following is antibacterial medicine prepared from Chlorella
    - i. Chlormelin
    - ii. Chlorellin
    - iii. Both
    - iv. None
  8. The sole method of reproduction in Chlorella is by
    - i. Aplanospore formation
    - ii. Akinetes
    - iii. Both
    - iv. None

| NUMBER | CORRECT OPTION |
|--------|----------------|
| 1      | i              |
| 2      | ii             |
| 3      | iii            |
| 4      | i              |
| 5      | i              |
| 6      | ii             |
| 7      | ii             |
| 8      | i              |

**TEST-02****CYNOBACTERIA**

1. Cynophyceae, myxophyceae and cyanobacteria refer to
  - a) Virus
  - b) Fungi

- c) Blue green algae
  - d) none
- 2. The wall of cyanobacteria is**
- a) Single gelatinous
  - b) Double gelatinous
  - c) Gelatinous
  - d) none
- 3. The majority of cyanobacteria live in**
- a) Marine water
  - b) Fresh water
  - c) Brackish water
  - d) Land
- 4. The sexual reproduction in blue green alga**
- a) Does not occur
  - b) Some times
  - c) Regular
  - d) none
- 5. Water blooms are found in**
- a) Winter
  - b) Spring
  - c) Summer
  - d) Autumn
- 6. One of the following is not reproductive method in cyanobacteria**
- a) Hormogonia
  - b) Akinetes
  - c) Budding
  - d) All
- 7. The Nostoc cytoplasm at border looks colorful due to**
- a) Centrioplasm
  - b) Cromoplasm
  - c) Both a & b
  - d) None
- 8. The structure that helps in nitrogen fixation and protein formation is**
- a) Hormogonium
  - b) Moniliform
  - c) Heterocyst
  - d) All
- 9. The asexual reproduction by Nostoc in favorable condition is**
- a) Akinetes
  - b) Hormogonia
  - c) Both a&b

- d) None
- 10. The endospore formation in Nostoc occur during**
- a) Favorable season  
 b) Unfavorable season  
 c) Both a&b  
 d) None

| QUESTION NO. | ANSWER KEY |
|--------------|------------|
| 1.           | C          |
| 2.           | B          |
| 3.           | B          |
| 4.           | A          |
| 5.           | C          |
| 6.           | C          |
| 7.           | B          |
| 8.           | C          |
| 9.           | B          |
| 10.          | B          |

- 1. Water mold (Oomycotes) is a pathogenic organism and causes**
- (a) Late blight of potato  
 (b) Fire bight of potato  
 (c) Slime mold  
 (d) None
- 2. Protozoa are generally single cellular and they are grouped according to**
- (a) Mode of nutrition  
 (b) Mode of locomotion  
 (c) Morphology  
 (d) Mode of reproduction
- 3. The time takes by a parasite before it appears in the blood is called**
- (a) Sporulation  
 (b) Gentangium  
 (c) Incubation  
 (d) All
- 4. During malaria, body temperature may rise up to 106<sup>0</sup>F**
- (a) True  
 (b) False

| QUESTION NO. | ANSWER KEY |
|--------------|------------|
|--------------|------------|

|    |  |
|----|--|
| 1. |  |
| 2. |  |
| 3. |  |
| 4. |  |