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Answer no 1

Classify protozoa jn to 4 mqin types.

Definition:

Protozoa are eukaryotic, unicellular microorganisms, which lack cell wall.

Characteristics of Protozoa:

The major distinguishing characteristics of protozoa are given below:

1. They do not have cell wall; some however, possess a flexible layer, a pellicle, or a rigid shell of inorganic materials outside the cell membrane.

2. They have the ability during their entire life cycle or part of it to move by locomotor organelles or by a gliding mechanism.

3. They have heterotrophic mode of nutrition, whereby the free-living forms ingest particulates, such as bacteria, yeast and algae, while the parasitic forms derive nutrients from the body fluids of their hosts.

4. They reproduce primarily by asexual means, although in some groups sexual modes also occur.

Classification of Protozoa:

The classification of protozoa is mainly based on their means of locomotion. They are subdivided into the following four classes (or subphyla by some taxonomists). Species marked with asterisks (*) have been described in details with illustrations.

1. Sarcodina:

Motility is due to the streaming of ectoplasm, producing protoplasmic projections called pseudopodia (false feet). Examples: Free-living form like Amoeba proteus* and parasitic form like Entamoeba histolytica*.

2. Mastigophora:

Locomotion is effected by one or more whip-like, thin structures called flagella. Examples: Free- living forms like Euglena viridis*, Cercomonas longicauda*, Heteronema acus* and parasitic forms like Trichomonas vaginalis, Trypanosoma gambiense*, Giardia lamblia*.

3. Ciliophora::
Locomotion is carried out by means of short hair-like projections called cilia, whose synchronous beating propels the organisms. Examples: Free-living forms like Paramecium caudatum*, Stentor polymorpha*, Vorticella campanula* and parasitic form like Balantidium coli*.

4. Sporozoa:
Unlike the above three classless of protozoa, members of the class sporozoa do not have locomotor organelles in their mature stage; however, immature forms exhibit some type of movement. All the members of this group are parasites.

Examples: Plasmodium, the malarial parasites of animals and human beings.

Types of Protozoa:

Based on the mode of nutrition, protozoa are of the following two types:
1. Free-living protozoa: They ingest particulates, such as bacteria, yeast and algae.

2. Parasitic protozoa: They derive nutrients from the body fluids of their hosts....

ANSWER NO 2.

THE COMPONENTS PRESENT IN PARAMECIUM CELL.

Pellicle - a membrane covering that protects the paramecium like skin
Cilia - hair like appendages that help the paramecium move food into the oral groove
Oral Groove - collects and directs food into the cell mouth
Cell Mouth - opening for food
Anal Pore - disposes of waste
Contractile Vacuole - contracts and forces extra water out of the cell
Radiating Canals - paths to the contractile vacuole
Cytoplasm - intercellular fluid needed to contain vital cell parts
Trichocyst - used for defense
Gullet - forms food vacuoles
Food Vacuole - storage pocket for food
Macronucleus - larger nucleus which performs normal cell functions
Micronucleus - smaller nucleus which is responsible for cell division.

ANSWER NO 3

What to know about parasites

Medically reviewed by **Alana Biggers, M.D., MPH** — Written by **Yvette Brazier** on February 16, 2018

A parasite is an organism that lives in another organism, called the host, and often harms it. It depends on its host for survival.

Without a host, a parasite cannot live, grow and multiply. For this reason, it rarely kills the host, but it can spread diseases, and some of these can be fatal.

Parasites, unlike predators, are usually much smaller than their host and they reproduce at a faster rate.

Fast facts on parasites

- Parasites live on or in other organisms and thrive to the detriment of their host.
- Many different parasites can affect humans, and they can pass on diseases such as **malaria** and trichomoniasis.
- Ensuring that food is fully cooked, using insect repellant, and following good hand hygiene rules can reduce the risk of getting parasites.

- A parasite is an organism that lives within or on a host. The host is another organism.
- The parasite uses the host's resources to fuel its life cycle. It uses the host's resources to maintain itself.
- Parasites vary widely. Around **70 percent**are not visible to the human eye, such as the malarial parasite, but some worm parasites can reach over 30 meters in length.
- Parasites are not a disease, but they can spread diseases. Different parasites have different effects.

Endoparasite

- These live inside the host. They include heartworm, **tapeworm**, and flatworms. An intercellular parasite lives in the spaces within the host's body, within the host's cells. They include bacteria and viruses.
- Endoparasites rely on a third organism, known as the vector, or carrier. The vector transmits the endoparasite to the host. The mosquito is a vector for many parasites, including the protozoan known as Plasmodium, which causes malaria.

Epiparasite

- These feed on other parasites in a relationship known as hyperparasitism. A flea lives on a dog, but the flea may have a protozoan in its digestive tract. The protozoan is the hyperparasite.

- Types
- There are three main types of parasites.
- Protozoa: Examples include the single-celled organism known as Plasmodium. A protozoa can only multiply, or divide, within the host.

- Helminths: These are worm parasites. **Schistosomiasis** is caused by a helminth. Other examples include roundworm, pinworm, trichina spiralis, tapeworm, and fluke.

- Ectoparasites: These live on, rather than in their hosts. They include lice and fleas.

ANSWER NO 4

DIFFERENCE AND SIMILARITIES BETWEEN FUNGI AND ACTINOMYCETS

1: difference between fugi and actinomycetes.

Microorganisms are tiny organisms which cannot be seen by our naked eyes. There are several groups of microorganisms. Bacteria and fungi are significant among them. Most bacteria and fungi are beneficial while a small percentage causes diseases and other harmful effects. Fungi play various crucial roles in the environment. They the dominant decomposers of organic wastes and are involved in recycling of nutrients in all terrestrial habitats. Fungi are able to break down complex material such as cellulose and lignin and help other organisms to absorb nutrients. Actinomycetes are a group of bacteria which are gram positive and behave like fungi. They are beneficial in agriculture and soil systems. Actinomycetes grow as colonies which resemble mycelia of fungi. The key difference between actinomycetes and fungi is that **Actinomycetes are prokaryoticorganisms while fungi are eukaryotic organisms.**

2: similarities between fungi and actenomycetes.

- Actinomycetes and fungi are filamentous.
- Both produce spores.
- Both types are good decomposers.
- Both groups include antibiotic producing species.

ANSWER NO 5

Prions piriods Viroids.

In 1971, Theodor **Diener**, a pathologist working at the Agriculture Research Service, discovered an acellular particle that he named a viroid, meaning “virus-like.” **Viroids**consist only of a short strand of circular RNA capable of self-replication. The first viroid discovered was found to cause **potato tuber spindle disease**, which causes slower sprouting and various deformities in potato plants (see Figure 1). Like viruses, potato spindle tuber viroids (PSTVs) take control of the host machinery to replicate their RNA genome. Unlike viruses, viroids do not have a protein coat to protect their genetic information.

Viroids can result in devastating losses of commercially important agricultural food crops grown in fields and orchards. Since the discovery of PSTV, other viroids have been discovered that cause diseases in plants. **Tomato planta macho viroid (TPMVd)** infects tomato plants, which causes loss of chlorophyll, disfigured and brittle leaves, and very small tomatoes, resulting in loss of productivity in this field crop. **Avocado sunblotch viroid (ASBVd)**results in lower yields and poorer-quality fruit. ASBVd is the smallest viroid discovered thus far that infects plants. **Peach latent mosaic viroid (PLMVd)** can cause necrosis of flower buds and branches, and wounding of ripened fruit, which leads to fungal and bacterial growth in the fruit. PLMVd can also cause similar pathological changes in plums, nectarines, apricots, and cherries, resulting in decreased productivity in these orchards, as well. Viroids, in general, can be dispersed mechanically during crop maintenance or harvesting, vegetative reproduction, and possibly via seeds and insects, resulting in a severe drop in food availability and devastating economic consequences.

Virusoids

A second type of pathogenic RNA that can infect commercially important agricultural crops are the **virusoids**, which are subviral particles best described as non–self-replicating ssRNAs. RNA replication of **virusoids** is similar to that of viroids but, unlike viroids, virusoids require that the cell also be infected with a specific “helper” virus. There are currently only five described types of virusoids and their associated **helper viruses**. The helper viruses are all from the family of **Sobemoviruses**. An example of a helper virus is the subterranean clover mottle virus, which has an associated virusoid packaged inside the viral capsid. Once the helper virus enters the host cell, the virusoids are released and can be found free in plant cell cytoplasm, where they possess ribozyme activity. The helper virus undergoes typical viral replication independent of the activity of the virusoid. The virusoid genomes are small, only 220 to 388 nucleotides long. A virusoid genome does not code for any proteins, but instead serves only to replicate virusoid RNA.

Virusoids belong to a larger group of infectious agents called **satellite RNAs**, which are similar pathogenic RNAs found in animals. Unlike the plant virusoids, satellite RNAs may encode for proteins; however, like plant virusoids, satellite RNAs must coinfect with a helper virus to replicate. One satellite RNA that infects humans and that has been described by some scientists as a virusoid is the **hepatitis delta virus (HDV)**, which, by some reports, is also called hepatitis delta virusoid. Much larger than a plant virusoid, HDV has a circular, ssRNA genome of 1,700 nucleotides and can direct the biosynthesis of HDV-associated proteins. The HDV helper virus is the **hepatitis B virus (HBV)**. Coinfection with HBV and HDV results in more severe pathological changes in the liver during infection, which is how HDV was first discovered.

Prions

At one time, scientists believed that any infectious particle must contain DNA or RNA. Then, in 1982, Stanley **Prusiner**, a medical doctor studying scrapie (a fatal, degenerative disease in sheep) discovered that the disease was caused by proteinaceous infectious particles, or **prions**. Because proteins are acellular and do

not contain DNA or RNA, Prusiner’s findings were originally met with resistance and skepticism; however, his research was eventually validated, and he received the Nobel Prize in Physiology or Medicine in 1997.