

Chapter 2: General information on the Protozoa sub-genome

General characteristics of protozoa

Unicellular organisms. (Protozoa)

(protos = first or primitive) unicellular organisms. These so-called primitive organisms are characterized by their microscopic size. This single, independent cell possesses a number of organelles that enable the cell to perform a number of functions (digestion, respiration, synthesis, locomotion, support, etc.).

- The systematics of protozoa is essentially based on the nature of the locomotor apparatus and on developmental characteristics. Among these phyla:

- 1 - Phylum Sarcomastigophora

- 2 - Phylum Sporozoa

- 3 - Phylum Ciliata

- 4 - Phylum Cnidosporidia

Protozoan distribution and ecological importance

- Most protozoa are free-living aquatic heterotrophs.

Some form intimate relationships with other species.

- If one of the individuals benefits without affecting the other, we speak of

commensalism (e.g. ciliates in the rumen of ruminants).

- When the association of symbionts is mutually beneficial, it's called mutualism.

- If one of the individuals benefits by affecting the other, it's called parasitism.

The animals included in phylum Protozoa can be defined as microscopic and a cellular animalcules without tissues and organs. They have one or more nuclei. Protozoa exist either singly or in colonies. Almost about 50,000 species are known till date.

General Characters of Phylum Protozoa ➤ Protozoan animals exhibit protoplasmic grade of organization. There is division of labor among various organelles of the cell. ➤ These are solitary (Euglena), or colonial (Proteospongia) ➤ They may be free living (Amoeba) or symbiotic (Parasitic, mutualistic or commensalistic) ➤ Body symmetry is symmetrical (Actinopodeans) or radial (sessile forms) or bilateral (Giardia) or absent (Amoeba) ➤ Locomotion is brought about by pseudopodia or flagella or cilia or myonemes.

Nutrient Cycling Protozoa

Nutrition is holozoic or holophytic or osmotrophic (Saprophytic or parasitic).

Digestion is intracellular. Some forms like Euglena are mixotrophic (perform more than one type of nutrition) ➤ Exchange of respiratory gases takes place by diffusion through the general body surface.

Respiration

Respiration is anaerobic in some parasitic forms. ➤ Excretion occurs by diffusion across general body surface or by contractile vacuoles. Contractile vacuoles serve mainly for Osmoregulation and are common in freshwater forms.

➤ Asexual reproduction takes place by binary fission or multiple fission or plasmotomy or budding. ➤ Sexual reproduction takes place by syngamy or conjugation ➤ Many forms undergo encystment to tide over unfavorable conditions ➤ Somatoplasm and germplasm are not differentiated. Hence they are immortal (exempt from natural death).

Classification of Phylum Protozoa

Phylum Protozoa is a large and varied group. This phylum has a number of problems in its classification. As per one of the classification given out by Hyman, Hickman and Storer, this phylum is divided into two subphyla on the basis of organs of locomotion. These two subphyla are further divided into 5 classes.