

## **Abstract**

Anaerobic protists are organisms that thrive in oxygen-free environments. They inhabit various anoxic habitats including marine and freshwater sediments, municipal landfills, but also gastrointestinal tracts of ruminants, cockroaches and other animals. They usually possess anaerobic mitochondrion-related organelles, usually hydrogenosomes that produce hydrogen. Compared to aerobes, metabolism of anaerobic protists is less efficient, but frequent interactions of anaerobes with prokaryotic organisms possibly enable them to increase their metabolic rate. Symbioses between protists and prokaryotes are ubiquitous and have arisen independently in many anaerobic lineages. Prokaryotes can be either endosymbiotic, living inside the host cell, or ectosymbiotic, attached to the surface of the host cell. There are two ecologically important groups of prokaryotes that are known to have established these symbiotic interactions with anaerobes. Methanogenic Archaea, mostly inhabiting the cytoplasm of the host, utilize H<sub>2</sub> and organic compounds to produce methane, and sulfate-reducing bacteria, mostly found as ectosymbionts, utilize H<sub>2</sub> and various organic compounds to use sulfate as terminal electron acceptor. Little is known about the exact nature of the relationships, species identity and host specificity of the prokaryotic symbionts. Further studies are required to fully understand the phenomenon of symbiosis in anoxic world.

Key words: **anaerobic protists, symbiosis, methanogenic Archaea, sulfate-reducing bacteria, hydrogenosomes**