

Symbiosis Encyclopedia Article

Symbiosis

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Symbiosis

Symbiosis is a close association and interaction between organisms of two or more species. Symbiotic relationships that have occurred over long periods of time may have resulted in evolutionary changes in the organisms involved in the relationship. In fact, some symbiotic relationships are considered necessary for the survival of the participating organisms.

Depending on the nature of the symbiotic relationship, there are three types of symbiosis: mutualism, commensalism, and parasitism. Mutualism is a symbiotic relationship that is beneficial to all participants and is often symbolized as (+, +). One example of mutualistic symbiosis is that of the nitrogen-fixing bacteria, *Rhizobia*, living in nodules on the roots of leguminous plants such as clover, alfalfa, peas, and beans. These bacteria are able to take atmospheric nitrogen, a form that plants cannot use, and transform it into a form that is usable by plants. The relationship is mutualistic because both organisms benefit; the plants gain the important nutrient nitrogen in a usable form, and the bacteria get a source of energy, usually glucose, from the plants.

Commensalism is a type of symbiosis in which one participant benefits from the relationship, while the other remains neutral (it is neither helped nor harmed). This relationship is often symbolized as (+, 0). An example of commensalism is the innkeeper worm, which burrows in marine sediments, and the animals that live within its tube. The organisms living within the burrow benefit because they receive protection and food as currents created by the worm pass through the burrow. The innkeeper worm does not appear to be affected by the organisms.

Parasitism is a symbiotic relationship resulting in the harm of the host organism. This type of symbiosis is often symbolized as (+, -). In this type of symbiosis, the organism that benefits is called the parasite, while the organism in or on which the parasite lives is called the host. Tapeworms that live within the digestive organs of mammals are an example of a parasite, while the mammal in which it lives is the host. This relationship is parasitic because the tapeworm benefits from obtaining nutrition from the host, while the host animal is harmed due to a decrease in nutrients and possibly even tissue damage.