

Marine Life Symbiosis - Tutorial Script

It's not just the physical and chemical characteristics of seawater and ocean ecosystems that affects marine organisms - they can have a great impact on each other as well. Some organisms live in very close **symbiotic** relationships with each other - which means one or both rely on the other for their survival. One type of symbiosis is called **commensalism** - in which one organism benefits, and the other isn't harmed or helped. This owl limpet is being used by the tiny buckshot barnacles as a substrate on which to grow. As the owl limpet moves over the rock, the barnacles are carried through the water column giving them greater access to food. Barnacles get their food by filtering it out of the water. They remain fixed in location and so are depending on the abundance of planktonic organisms living in the water around them. Another example of commensalism is shown in this picture here. This small amphipod is living attached to the outside of a sponge. Sponges filter huge quantities of water through their pores every day. This amphipod sits outside one of those holes and feeds itself off the organisms in the currents.

Mutualism is a form of symbiosis in which both organisms benefit. An example is shown here with anemone and clown fish. Stinging cells in the anemones can scare off the predators of the clown fish. The clown fish has developed an immunity to the toxins in the stinging cells, and they hide in the anemone. But they also can aggressively attack and scare off the anemone's main predators - sea stars and sea snails. So both benefit. Another example of mutualism happens inside this sunburst anemone on the Pacific Coast. Its green color comes from tiny photosynthesizing algae that live within it and get their nutrients from the waste of the anemone. The anemone, in turn, feeds off the garden of algae as needed to supplement its own food source. Heterotrophs that act as hosts for this special kind of mutualistic relationship, in which an autotroph lives within and acts a food source for the heterotroph (like a live-in garden) are called **mixotrophs**. Other examples include most tropical corals and tube worms that live around hydrothermal vents.

The remaining type of symbiosis is called **parasitism**. In this case, the host is actually harmed by the symbiont. An example is shown here. These sucker isopods attack the outside of this fish and get their sustenance from feeding directly off the fish's body. Naturally this is harmful to the fish. Similar parasitic relationships happen with worms that live in the intestines of a variety of marine mammals, feeding off the food the animal has eaten and significantly decreasing the nutrition these animals receive from their meals. Here is another example - sea lampreys - jawless fish that bore into the outside flesh of other fish and feed off them. Note: parasites will not usually kill their hosts - to do so would be self-defeating. They feed just enough to meet their own needs, depending on their host to stay alive long enough to support their needs.

Pause now.

[end credits]

Living Ocean Video Series:

Part 1: Life and the Ocean's Physical Environment

Part 2: Life and the Ocean's Chemical Environment

Part 3: Marine Life Symbiosis

Marine Life Symbiosis

Produced by Katryn Wiese

City College of San Francisco

Copyright: Creative Commons: Attribution - Noncommercial - Share Alike 3.0

All media produced by Katryn Wiese unless indicated below:

*Intro and exit music: used with permission © Alexis Harte

*Review music: used with permission © Proceed With Caution

*Clown fish and anemones (2 photos) - NOAA

*Rift worms - NOAA

- *Coral – Jim Maragos – US Fish and Wildlife – CC Attribution 2.0 Generic*
- *Sponge and Amphipod – NOAA*
- *Sucker Isopod – Etrusko25 – Public Domain*
- *Nematode worm + mammals diagram – Public Domain, USGOV-HHS-CDC*
- *Lampreys – USGS*