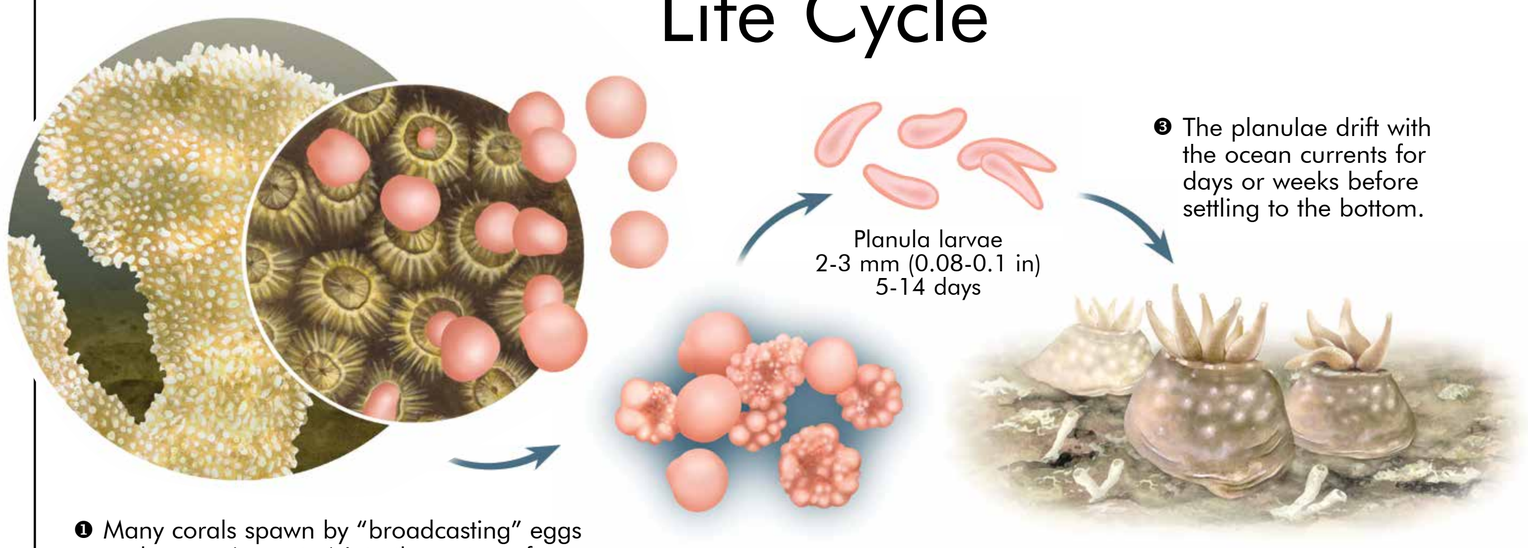
Elkhorn Coral

Acropora palmata

Life Cycle



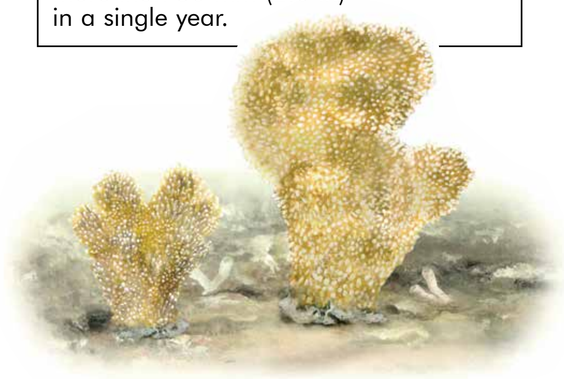
❶ Many corals spawn by "broadcasting" eggs and sperm (gametes) into the water a few days after the full moon of late summer. Elkhorn corals release gamete "bundles" that will break up at the surface to release the gametes. Other coral species release only sperm that then fertilize eggs held in other colonies. The fertilized eggs are brooding species is also on a lunar cycle but occurs more frequently during the year.

❷ Bundles break up allowing eggs to be fertilized by sperm from other colonies. After 1 2 hours, cell division begins and the eggs develop into planula larvae.

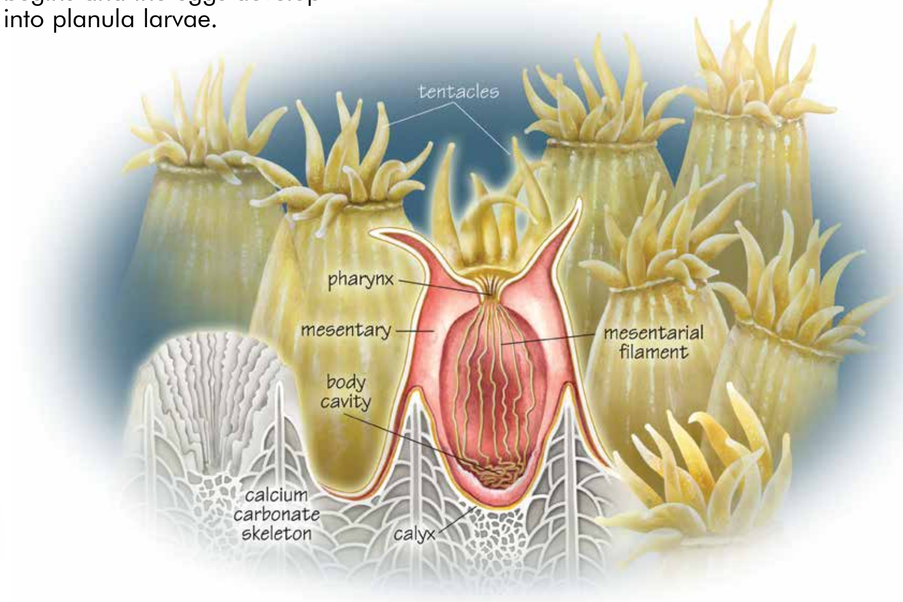
❸ The planulae drift with the ocean currents for days or weeks before settling to the bottom.

❹ If the planulae find a suitable spot they will attach, round up and transform into the first polyp of a new colony.

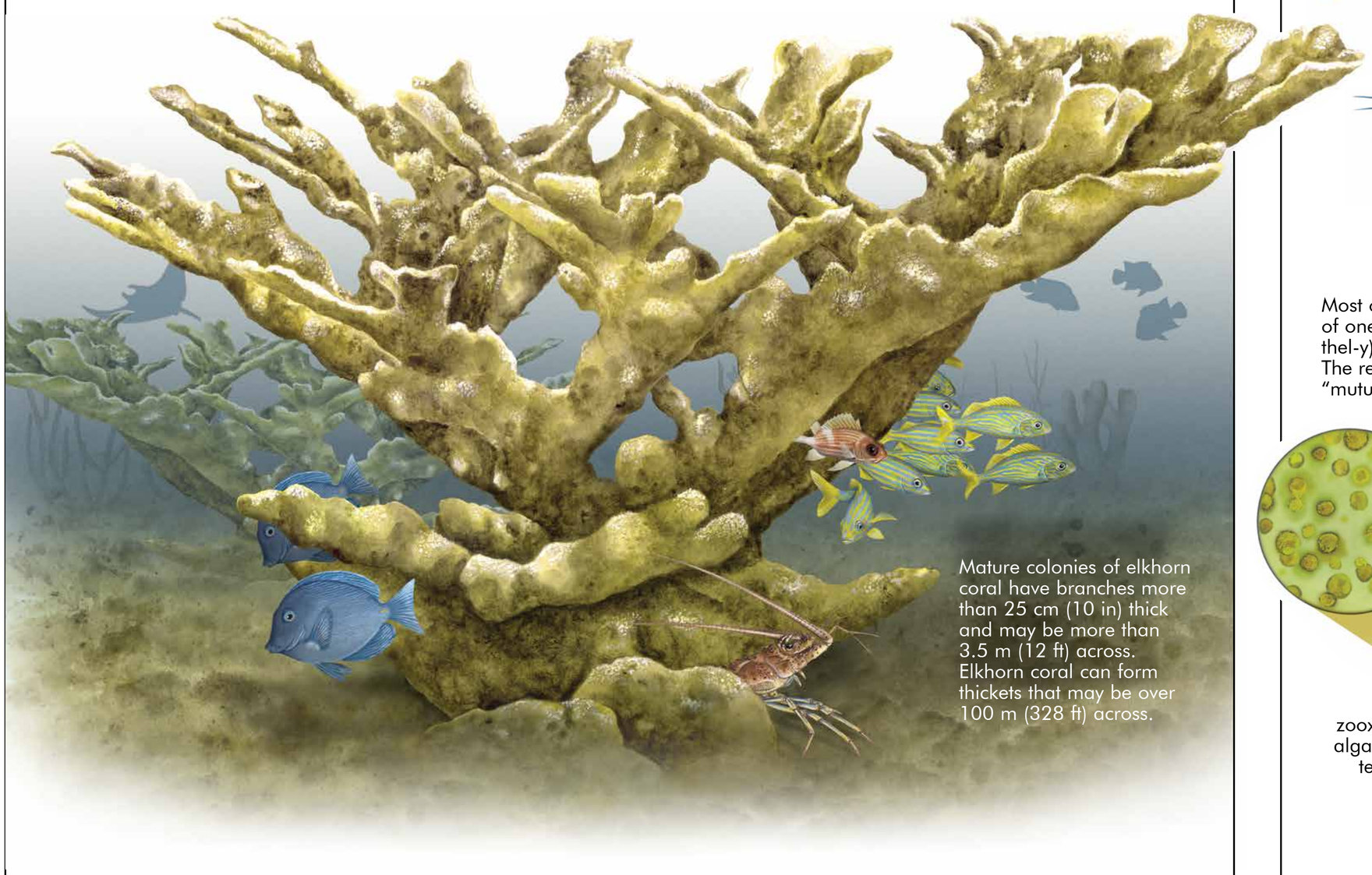
Most corals grow just 3–10 mm (0.1–0.4 in) each year. Elkhorn corals may grow more than 50 mm (2.0 in) in a single year.



❺ The polyp immediately begins secreting a limestone skeleton that may eventually weigh several tons.



Although coral skeletons may become massive, they are very delicate when examined closely. Each polyp looks like a small anemone lying within a limestone cup, the calyx. Each coral species has a unique calyx structure as well as colony shape.



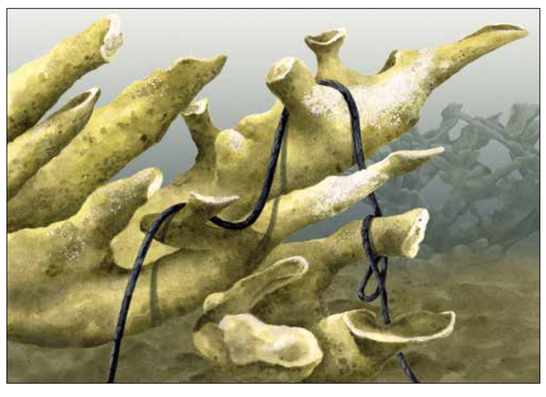
Mature colonies of elkhorn coral have branches more than 25 cm (10 in) thick and may be more than 3.5 m (12 ft) across. Elkhorn coral can form thickets that may be over 100 m (328 ft) across.

Ecological Significance

Branches broken off by storms may survive and form new colonies, a form of asexual reproduction. In this way, large elkhorn thickets can be formed in the shallow portions of reefs. Their complicated shapes provide a variety of refuges for fish, spiny lobsters and other reef inhabitants. The relatively fast growth of elkhorn corals has allowed them to keep up with sea level rise and they have been responsible for much of the structure seen on reefs of the Greater Caribbean today.

Threats

Coral reefs are subject to many natural and human impacts. Boats, anchors, coastal development, and diseases such as coral bleaching and white band disease have substantially reduced elkhorn, and other, coral populations. The elkhorn and staghorn (below) corals have been listed under the U.S. Endangered Species Act as "Threatened Species".



Related Species

There is just one other true *Acropora* species in the Greater Caribbean, the staghorn coral. It was thought that there were a total of three species but genetic studies have shown the fused staghorn coral to be a hybrid of the elkhorn and staghorn corals. There are over 150 species of *Acropora* in the Pacific ocean.

Staghorn coral
Acropora cervicornis

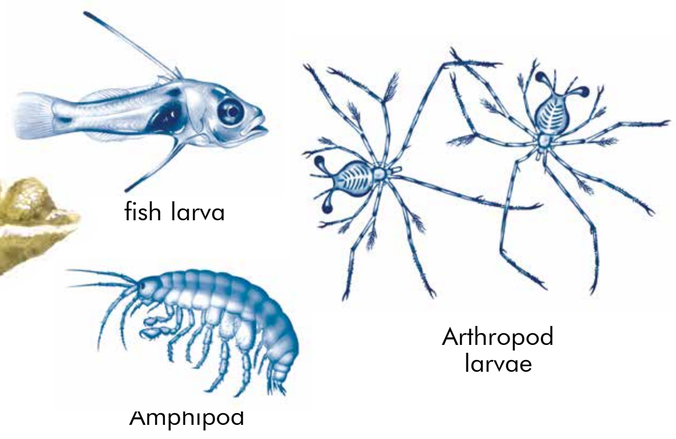
Fused staghorn coral
"Acropora prolifera"

Coral Nutrition

Most corals are both *heterotrophic* (catching nutrition from outside sources) and *autotrophic* (relying on photosynthesis from symbiotic algae).

Heterotrophy

Coral polyps capture plankton and particulate matter from the water with their tentacles. Stinging cells (nematocysts) immobilize the prey which are then moved to the mouth of each polyp. The polyps within colonies are interconnected and share nutrients obtained from prey.



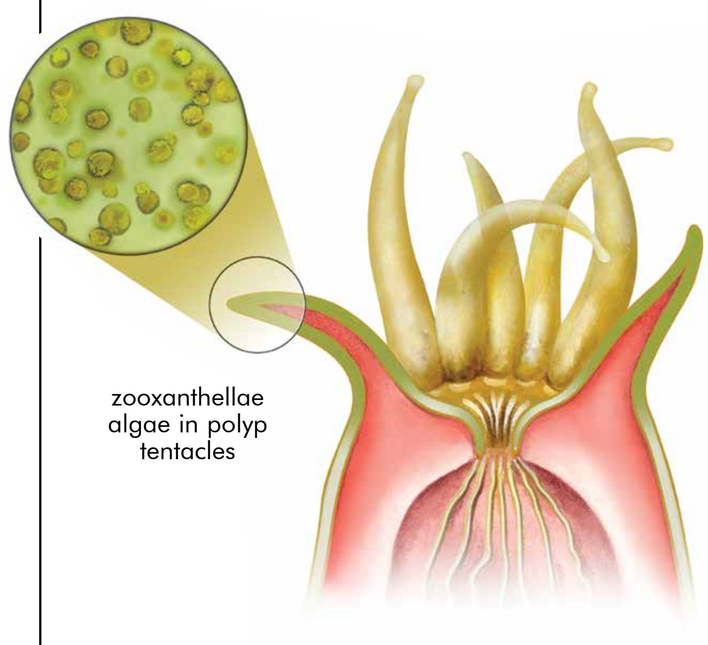
fish larva

Arthropod larvae

Amphipod

Autotrophy

Most of the color in reef corals is due to the presence of one-celled plants called zooxanthellae (zoo-zan-thel-y) within the endodermal cells of the coral animal. The relationship is a type of symbiosis known as "mutualism" where each partner benefits.



zooxanthellae algae in polyp tentacles

The zooxanthellae receive shelter, nutrients (animal waste products) and carbon dioxide. Photosynthesis by the zooxanthellae produces lipids, amino acids and oxygen that are used by the coral tissues. The photosynthetic activity by zooxanthellae also helps the coral to secrete its limestone skeleton, thus promoting faster growth of the entire colony.

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