

# Coral Reefs

## 'The Living Organisms'



*Some of the biodiversity of a coral reef, in this case the Great Barrier Reef, Australia*

**Called “rainforests of the sea”, coral reefs are living organism and the oldest, most productive ecosystems on earth.**

Existing for more than 500 million years, Corals are marine organisms from the class Anthozoa and exist as small sea anemone-like polyps, typically in colonies of many identical individuals. The group includes the important reef builders that are found in tropical oceans, which secrete calcium carbonate to form a hard skeleton.

A coral "head", commonly perceived to be a single organism, is formed from myriads of individual but genetically identical polyps, each polyp only a few millimeters in diameter. Over thousands of generations, the polyps lay down a skeleton that is characteristic of their species. An individual head of coral grows by asexual reproduction of the individual polyps. Corals also breed sexually by spawning, with corals of the same species releasing gametes simultaneously over a period of one to several nights around a full moon.

Although corals can catch small fish and animals such as plankton using stinging cells on their tentacles, these animals obtain most of their nutrients from photosynthetic unicellular algae called zooxanthellae. Consequently, most corals depend on sunlight and grow in clear and shallow water, typically at depths shallower than 60 metres (200

ft). These corals can be major contributors to the physical structure of the coral reefs that develop in tropical and subtropical waters, such as the enormous Great Barrier Reef off the coast of Queensland, Australia. Other corals do not have associated algae and can live in much deeper water, with the cold-water genus *Lophelia* surviving as deep as 3,000 metres (9,800 ft). Examples of these can be found living on the Darwin Mounds located north-west of Cape Wrath, Scotland. Corals have also been found off the coast of Washington State and the Aleutian Islands in Alaska.

Corals coordinate behaviour by communicating with each other.

Globally, coral reefs are under threat from climate change, ocean acidification, overuse of reef resources, and harmful land-use practices. High nutrient levels such as those found in runoff from agricultural areas can harm reefs by encouraging excess algae growth.

## Formations

Coral reefs can take a variety of forms, defined in following:

- **Fringing reef** – a reef that is directly attached to a shore or borders it with an intervening shallow channel or lagoon.
- **Barrier reef** – a reef separated from a mainland or island shore by a deep lagoon (*Great Barrier Reef*).
- **Patch reef** – an isolated, often circular reef, usually within a lagoon or embayment.
- **Apron reef** – a short reef resembling a fringing reef, but more sloped; extending out and downward from a point or peninsular shore.
- **Bank reef** – a linear or semi-circular shaped-outline, larger than a patch reef.
- **Ribbon reef** – a long, narrow, somewhat winding reef, usually associated with an atoll lagoon.
- **Atoll reef** – a more or less circular or continuous barrier reef extending all the way around a lagoon without a central island.
- **Table reef** – an isolated reef, approaching an atoll type, but without a lagoon.

## •Distribution

Coral reefs are estimated to cover 284,300 square kilometers, with the Indo-Pacific region (including the Red Sea, Indian Ocean, Southeast Asia and the Pacific) accounting for 91.9% of the total. Southeast Asia accounts for 32.3% of that figure, while the Pacific including Australia accounts for 40.8%. Atlantic and Caribbean coral reefs only account for 7.6%.



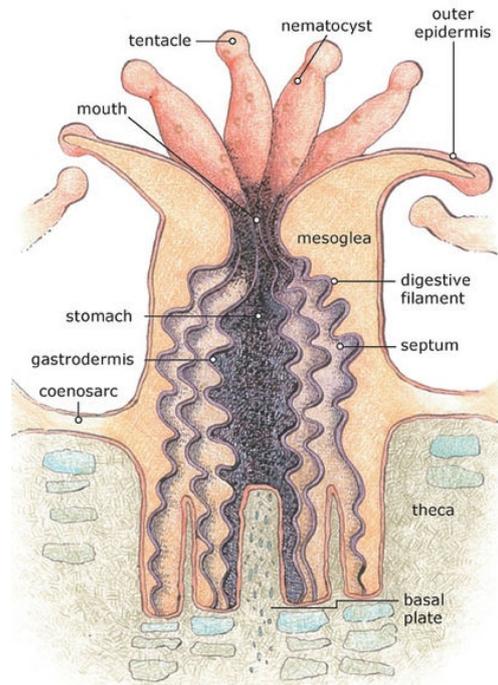
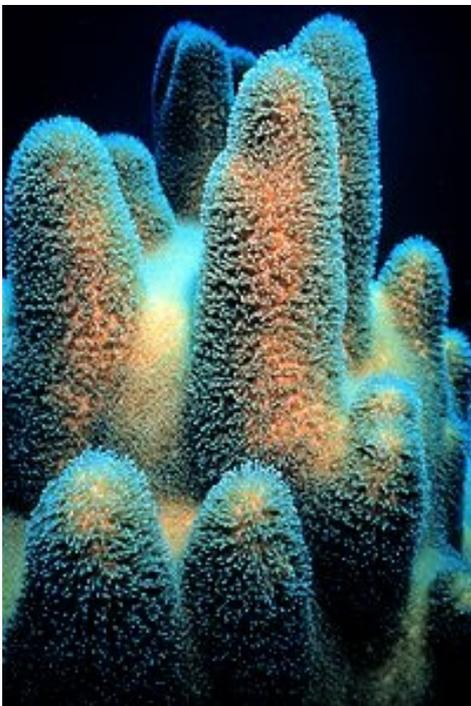
*Location of coral reefs*

## Locations of coral reefs.

Although corals exist both in temperate and tropical waters, shallow-water reefs form only in a zone extending from 30°N to 30°S of the equator. Tropical corals do not grow at depths of over 50 m (165 ft). Temperature has less of an effect on the distribution of tropical coral, but it is generally accepted that they do not exist in waters below 18 °C., and that the optimum temperature is 26-27° Celsius for most coral reefs. The reefs in

### Famous coral reefs and reef areas of the world include:

- The Great Barrier Reef - largest coral reef system in the world, Queensland, Australia;
- The Belize Barrier Reef - second largest in the world, stretching from southern Quintana Roo, Mexico along the coast of Belize to the Bay Islands of Honduras.
- The New Caledonia Barrier Reef - second longest double barrier reef in the world, with a length of about 1500 km.
- The Andros, Bahamas Barrier Reef - third largest in the world, following the east coast of Andros Island, Bahamas, between Andros and Nassau.
- The Red Sea Coral Reef - located off the coast of Israel, Egypt and Saudi Arabia.
- Pulley Ridge - deepest photosynthetic coral reef, Florida
- Numerous reefs scattered over the Maldives
- The Raja Ampat Islands in Indonesia's West Papua province offer the highest known marine diversity.



*Anatomy of coral polyp*