

## Unit Eight: Tropical Communities & Symbiotic Relationships

### Coral

- There are two types of corals:
  - \_\_\_\_\_ corals produce reefs and are found only in tropical regions. They have a small symbiotic plant cells called zooxanthellae living in their tissues.
  - Ahermatypic corals are found throughout the world, do not produce reefs, and most do not have \_\_\_\_\_.

### Coral Reefs

- Coral reefs are massive deposits of calcium carbonate (\_\_\_\_\_) produced by corals. They are among the most productive systems in the world and have the greatest diversity per unit area of any marine ecosystem.

### Coral Reefs: Limiting Factors

- Six major physical factors limit coral reef development:
  - Temperature (23-25°C)
  - \_\_\_\_\_ (<40m)
  - Light (high)
  - Salinity (>25ppt)
  - Sedimentation (low)
  - \_\_\_\_\_ (limited)

### Coral Structure

- Almost all hermatypic corals are colonial, with individual coral animals called \_\_\_\_\_ occupying little cups or corallites in the skeleton.

### Types of Coral Reefs

- Coral reefs are grouped into one of three categories
  - \_\_\_\_\_ are horseshoe shaped reefs that rise out of very deep water and enclose a lagoon. The lagoon may contain lagoon reefs or patch reefs. Atolls are frequently formed on volcanic islands that have subsided.
  - Barrier Reefs occur adjacent to landmasses, separated by a deep water channel.
  - \_\_\_\_\_ Reefs also occur adjacent to landmasses, but are closer and not separated by a deep water channel.

### Coral Reef Fishes: Diurnal Planktivores

- Diurnal planktivores feed in aggregations during the \_\_\_\_\_. These fish generally have eyes close to the front of the head, small upturned mouths, highly protruding and \_\_\_\_\_ jaws.
- In order to reduce predation, diurnal planktivores generally show interspecific convergence and spines on their fins.
- Major families include damselfishes (Pomacentridae), butterflyfishes (Chaetodontidae) and surgeonfishes (Acanthuridae).

### Coral Reef Fishes: Nocturnal Planktivores

- Nocturnal planktivores feed on small prey under low light, generally having larger eyes and \_\_\_\_\_, \_\_\_\_\_ or silver coloration.
- Major families include squirrel fishes (Holocentridae), big-eyes (Priacanthidae) and cardinalfishes (Apogonidae).

### Coral Reef Fishes: Herbivorous Fishes

- Herbivorous fishes consume plant material that grows on the reef. They generally have deep and laterally compressed bodies, small mouths and long guts.
- Major families include \_\_\_\_\_ (Scaridae), triggerfishes (Balistidae) and blennies (Blennidae).

### **Coral Reef Fishes: Carnivorous Fishes**

- Carnivorous fishes feed on other animals, including a wide range of invertebrates. Carnivorous fishes have the highest degree of feeding specialization, and are generally put into one of three categories:
- \_\_\_\_\_ feed on small benthic crustaceans. Families include damselfishes and butterflyfishes.
- Crunchers crush the shells of sponges, tunicates, etc. Families include pufferfishes (Tetraodontidae) and wrasses (Labridae)
- \_\_\_\_\_ feed on other fish. Families include requiem sharks (Carcharhinidae), moray eels (Muraenidae) and scorpionfishes (Scorpaenidae)

### **Mangrove Forests**

- Another important tropical community is the mangrove forest. These are inshore marine communities dominated by several species of \_\_\_\_\_ trees and shrubs.
- Mangroves have shallow roots that spread widely and send up extensions called pneumatophores to the surface that allow the roots to receive oxygen in the \_\_\_\_\_ substrate.

### **Symbiosis**

- \_\_\_\_\_ is the interrelationship between two different species which are generally either harmless to either member, or, more likely, beneficial to one or both.

### **Symbiotic Relationships**

- \_\_\_\_\_ is an association that is clearly to the advantage of one member while not harming the other member. The partner gaining the advantage is called the commensal and the other is the host.
- Mutualism is the form of symbiosis in which two species associate for their mutual benefit. The partners are called symbionts.

### **Algal Symbioses**

- All known symbiotic relationships in the sea between plants and animals are between unicellular algae or their chloroplasts and a wide variety of marine invertebrate animals.
- The algal cell symbionts have been typically classified into groups on the basis of their color.
  - \_\_\_\_\_ are brown, golden, or brownish-yellow cells
  - Zoochlorellae are green
  - Cyanellae are blue or bluish-green

### **Animal Symbioses**

- Marine commensals that live on other invertebrates are called \_\_\_\_\_. Those that live inside other animals but are not parasites are called \_\_\_\_\_.

### **Luminescent Bacteria**

- Most common in mesopelagic fishes and squids, various marine animals incorporate luminescent bacteria into cavities near their outer surface.
- The light produced by the bacteria is usually continuous. As a result, the fishes and \_\_\_\_\_ often develop elaborate modifications to control the light (ex. reflective surfaces, screens or shades).