

Lecture 36

NEKTONIC ORGANISMS

General characteristics

Representatives

Invertebrates

Fish

Cetaceans -- whales and porpoises

Other mammals

Reptiles

Migration during life cycle -- some examples

GENERAL CHARACTERISTICS

Nektonic organisms are swimmers

Mode of nutrition: Both....

Herbivores

Carnivores (predators, scavengers)

Vertebrates dominate the nekton

INVERTEBRATE NEKTON -- relatively few representatives

Different evolutionary branch from vertebrates- can track evolution through fossils in ocean sediments

Examples:

Large shrimp (Arthropods)

Cephalopods (class of Mollusca):

Chambered Nautilus

Cuttlefish

Squid

FISH -- THE DOMINANT TYPE OF NEKTONIC LIFE

- Distributed world-wide
- Occur at all depths
- Concentrated in the epipelagic zone (0-200m)
- Deep-water and bottom dwellers also

Cartilagenous fish: skeletons of cartilage, not bone

Sharks- well adapted (evolved over 300 Million Years ago!)

Wide-spread, epipelagic

Active predators (but some are plankton feeders)

Skates and rays

Shallow-bottom dwellers

Carnivores AND plankton feeders

Bony fish: (includes most eels)

Epipelagic representatives (commercially fished)

- Tuna, Salmon -- predators
- Herring, Anchovy -- plankton feeders

Coastal bottom-dwellers (commercially fished)

- Halibut, Sole

Deep-sea (>200m; dark) bony fish

Habitat: Below the photic zone

All species are carnivorous

Food comes down from photic zone

Scarce food below about 1000m

Competition

Need to attract prey

Need to eat large prey- as large as possible

Need to conserve energy between meals

General features -- adaptations:

- Large, light sensitive eyes
- Small (<10 cm), Low rates of metabolism
- Large mouths, well-developed teeth
- Luminiscent -- light-producing organs
 - Attraction of prey
 - Mate selection

Representative deep-sea fish:

Cyclothone, Lantern fish

- Abundant mesopelagic fish
- Members of the "Deep-Scattering Layer"
- Feed on Euphausiids (Krill) and Copepods

Hatchetfish

- Eyes and mouth directed upward

Angler fish

- Luminous moveable lure
- Parasitic male attached to body of female

CETACEANS

Evolved from a common **terrestrial** ancestor

1. Baleen whales -- filter-feeders (plankton, e.g., krill, small fish)
2. All other whales, plus porpoises, dolphins

Toothed

Fast-swimming predators

OTHER MARINE MAMMALS

1. Pinnipeds ("feather-footed") ...common ancestors

Seals, Sea Lions, Walruses

Habitat: polar, midlatitudes

Require shore and/or sea-ice areas

2. Sea cows -- Manatees, Dugongs: tropical herbivores

3. Sea otters

Habitat: cold, coastal waters

Nutrition: carnivores of clams, sea urchins, etc.

MARINE REPTILES

Few species, but successful

Representatives:

Turtles

Crocodiles
Snakes
Marine Iguanas

MIGRATION OF NEKTONIC SPECIES -- SOME NOTABLE EXAMPLES

WHY MIGRATION? Migration links

... regions appropriate for reproduction

... regions of feeding for adults

Examples:

California Grey Whales- Mexico to Alaska

Pacific Salmon- fresh water spawning

Atlantic Eels- salt water spawning- opposite

Spawn at sea; adults migrate to fresh-waters

Atlantic Green Turtles- nesting sites vs. foraging