

Nekton

Nekton comprise all the fast and free swimming animals of the pelagic waters. The term "nekton" was coined by Ernst Haeckel (1890) and it is derived from the Greek word nekton, which means "swimming". These nekton are provided with efficient locomotory organs, called fins, and hence they are not at the mercy of currents. Most nekton are carnivores (flesh eaters) and predators (organisms that kill and eat other animals) and some are scavengers (flesh eaters that don't kill what they eat). Often, predators will eat dead animals if they are available. A few nekton are carnivorous filter feeders (animals that filter large volumes of water to obtain their food, which is usually zooplankton) e.g. baleen whales.

The nektonic animals include chordates and invertebrates such as molluscs and arthropods. There are no plants under this category. These animals are of different sizes and able to migrate freely throughout the oceans. They possess a variety of feeding habits and most of them feed on planktonic organisms (both phytoplankton and zooplankton) found in the marine and fresh waters. The locomotory organs are not only used to maintain their positions against the water movements for quite some time but also used to pursue prey, escape from enemies and for undertaking long distance migrations. These animals are having streamlined body with slime cover to reduce resistance while moving through the water. The musculature, nervous system and vision are the special adaptations found in the nektonic animals, which help them to lead nektonic life.

TYPES OF NEKTON

Types of nekton There are three types of nekton viz. chordates, molluscs and arthropods. The majority of the nekton species consists of carnivorous organisms which find their prey over a wide area.

1. Chordates

Nekton belonging to the chordates form the largest group, having bones or cartilage. This group includes sharks, bony fish, whales, porpoises, dolphins, seals, turtles, snakes, and sea birds. There are more than 25,000 species of fishes, higher than any other group of vertebrates.

i. Fishes

Fishes represent the major constituent of the nektonic vertebrates. Based on the habitat they inhabit, these are grouped into holoepipelagic and meroepipelagic. Holoepipelagic fishes are those that spend their entire lives in the epipelagic region. These fishes include most of the tropical and subtropical fishes which often lay floating eggs and have epipelagic larval life. The meroepipelagic fishes spend only part of their life in the epipelagic region and visit this region to find their prey. They may spawn in inshore or fresh water regions. Herbivorous species like the

anchovy (*Engraulis encrasicolus*), however, play a major role in upwelling areas of the sea where enormous quantities of fish can be harvested.

ii. Reptiles

The nektonic marine reptiles include sea snakes and turtles. These are cold blooded animals. Though the turtles are true pelagic animals they often visit the shores for breeding. Their limbs are modified to form paddles, which enable them to swim fast, and they can also drift motionless. The leathery turtle (*Dermochelys*) and the hawk-billed turtles (*Chelonia imbricata*) are carnivores, and known to feed on medusae, crustaceans, cephalopods and fishes, while the green turtle (*Chelonia mydas*) feeds largely on seaweeds and eel-grass.

The sea-snakes are represented by more than sixty species distributed abundantly in the Indo-Pacific region. Important genera include *Enhydrina*, *Pelamis*, *Microcephalophis* and *Laticauda*. They feed mainly on the fish. They are viviparous and mostly venomous.

iii. Seabirds (Aves)

Seabirds (Aves): Seabirds, which are warm blooded nektonic animals, play a significant role in the food chain dynamics of the marine ecosystem. Especially their interaction with marine fishes and fishing is regarded as very important. "Seabird" is rather a loose term traditionally used to cover those birds which obtain at least part of their food from the sea by travelling some distance over or under its surface. They typically breed on offshore or coastal areas like cliffs, dunes, skerries or remote islands. There are 274 species of seabirds, comprising mainly penguins, albatrosses, fulmars, petrels, shearwaters, pelicans, cormorants, skuas, ducks, terns and auks. Seabirds are characterized by long life (high adult survival rate), higher age at first maturity and breeding, slow reproductive rate and intense care for the offspring.

iv. Mammals

Mammals: The mammals include the seals, dugongs, manatees, dolphins, porpoises and whales, of which the whales are the most important. These are the largest members of the nekton. The blue sulphur-bottom whale, a plankton feeder, attains a length of 25 metres and a weight of 60-80 tons. The toothed whales (sperm whale, *Physeter catodon*, and killer whale, *Orcinus orca*) are predators feeding on squids and large fish. The whalebone whales (baleen whales) on the other hand feed on plankton, mainly sieving euphausiids and others from surface waters.

Marine Mammals

i. Temperature Maintenance

Ø Large size - less loss of body heat (reduces surface to volume ratio)

Ø Insulating layers of blubber or fat

Ø Adaptations of the circulatory system for reducing heat loss

ii. Respiratory modifications for diving

Ø Have the ability to hold their breath for extended periods of time making deep dives possible.

Ø They are able to dive with their lungs empty avoiding problems of buoyancy and bends (nitrogen bubbles in the blood)

Ø Their blood is rich in haemoglobin and other respiratory pigments, and the muscles are rich in myoglobin (another respiratory pigment in the muscles).

Ø During deep dives, sphincters in arteries shut off blood to parts of the body so it only goes where it

Ø Is needed.

Ø The heart slows, and the muscles can tolerate a greater oxygen debt than terrestrial animals.

Ø When the animal surfaces and breathes, a very rapid O₂-CO₂ exchange occurs.

iii. Osmotic Adaptations

Ø The kidneys reabsorb water and they excrete a very concentrated urine

Ø Fatty insulating layers may also play a role in water storage.

Ø Most water intake comes from the fish they eat.

Oceanic nekton also have adaptations for locomotion, surface resistance, defense (cryptic coloration), sensory systems (echolocation). Some have osmotic adaptations to allow for absorption of fresh water