Marine Mammals

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The study of marine mammals included whales, dolphins, seals, manatees, sea otters, and polar bears. The latter are considered marine mammals because they devote so much time to being in the water and rely exclusively on the sea for food. Although most marine mammals live in saltwater, there are a few freshwater species.

Evolution

Marine mammals evolved from terrestrial ancestors that may have returned to the sea to avoid predation and take advantage of a rich food resource. They are young on the evolutionary scale of mammals, less than one hundred million years old. Over time, they have lost their rear limbs and developed other mechanisms to help them cope with the aquatic environment. Many have very streamlined bodies to improve swimming ability and their ears have been reduced to small holes.

Many have a layer of blubber to help insulate them from the cold and provide a food resource in times of low food availability. They also use counter current heat exchange systems, allowing the warmth from their arteries to spread to the veins and reduce heat loss. Some, such as otters and polar bears, have thick fur to help protect them from the cold.

Swimming & Diving

Many marine mammals can dive for extended periods of time. They have the ability to take very deep breaths in very short periods of time. Most Pinnipeds (seals) can dive for about 30 minutes at depths of 150-250 m. The Weddell seal can stay down for up to 73 minutes at depths of 600 m. Whales can stay down for even longer, often for hours at depths of up to 2,250 m. They have evolved different mechanisms to avoid issues with pressure and nitrogen absorption that plague diving people. Their lungs are collapsible allowing them to store air in their windpipe. This prevents nitrogen being absorbed by the tissues. They also slow their heartbeats by 10-20% and reduce blood flow to extremities to reduce oxygen consumption while diving. Most marine mammals are also exceptional swimmers. Dolphins can speeds of up to reach up to 64 km/h.

Communication & Whale Song

Many marine mammals are very social, living in pods or colonies. The cetaceans (whales and dolphins) are known to stay in family groups even when an injured individual is unable to leave. This believed to be a part of the mechanisms that lead to beaching. They are considered highly intelligent and communicate through sounds. These sounds are used to attract mates, co-ordinate hunting, and may even serve to identify different pods from one another.

Echolocation

Cetaceans also use echolocation to hunt. Sperm whales may even use echolocation to stun squid with the sound of the clicks. Whales have a melon structure on their head that focuses and directs sound waves. Sounds are detected by the lower jaw mainly, and transmitted to the ear.

With many marine mammals considered endangered or threatened due to hunting and as a side effect of fishing mechanisms, conservation is a key aspect of research. Communication and intelligence studies are also quite common with the cetaceans.
