Marine mammals

Mammals are a special group of animals with a combination of characteristics that separate them from all other animals:They are warm-blooded, have four chambered hearts, have hair or fur, breathe air through lungs, bear live young, and nurse their young with milk produced by mammary glands.

Obviously there are a lot of examples of animals that live on land that meet these five qualifications, including dogs, horses, cats, rats, pigs and people.

For animals that live in the seas and oceans, those that meet all five criteria certainly include seals, sea lions, walruses, sea otters, polar bears and manatees.

All marine mammals were originally land mammals and share common ancestry and characteristics with every other mammal. Over time they became more and more specialized to meet the challenges of life in an aquatic environment. For example, cetaceans, who live their entire lives in the water, have little need for hair. In fact hair can be a problem by acting as a drag to slow them down as they speed through the water. To be more efficient in the water they have lost almost all of their hair. On the other hand, slower swimming marine mammals that still spend a lot of their time on land, such as polar bears and sea otters, still rely heavily on the protection and insulation that their hair or fur provide.

Marine mammals are vertebrates , adapted to live , feed and reproduce in the marine environment exclusively and they never visit terrestrial environment except few species of carnivores. There are about 120 species of marine mammals, those mammals that live in the sea for the greater part of their lives.

They include whales (cetaceans), some species of which filter-feed directly on zooplankton and small fishes whereas other species feed high in the food web (e.g. killer whales), and seals/sea lions (pinnipeds), which tend to be high in the food web and feed mainly on fish. Marine mammals can be subdivided into four recognised groups; cetaceans (whales, dolphins and porpoises), pinnipeds (seals, sea lions and walruses), sirenians (manatees and dugongs), and fissipeds, which are the group of carnivores with separate digits (the polar bear, and two species of otter). Both cetaceans and sirenians are fully aquatic and therefore are obligate ocean dwellers. Pinnipeds are semi-aquatic; they spend the majority of their time in the water, but need to return to land for important activities such as mating, breeding and molting. In contrast, both otters and the polar bear are much less adapted to ocean living. Now a days the members of the pinnipedia and the carnivoras are grouped into one order of carnivore for practical convenience. Hence,today the marine mammals are grouped into mainly three orders viz. cetacea, sirenia and carnivora. As these are the warm blooded animals, they have the special adaptation to keep their internal body temperature warm and for this, most marine mammals have thick layer of blubber or fatty subcutaneous layer under the skin, which keep the body warm in the aquatic environment.

There are about 78 species of cetaceans and 4 species of sirenians. In India marine mammals, are represented by all cetaceans and one sirenian species(Dugong). Among the marine carnivores , no seals or sea lions have been reported to be present in or near India and also no Indian carnivore is visiting marine or sea regularly.

Many species can stay under water for a long time, but must come to the surface to breathe. To enable then to stay under water for long periods, they store extra oxygen in their muscles and blood. They also have more blood than land mammals in proportion to their body sizes, can direct their blood flow to only their vital organs (such as their heart and lungs), and can slow their heartbeat down so they are using less oxygen in a dive.

A Taxonomic Classification of Marine Mammals

Most of these groups are made up entirely of animals that live in seas, oceans, rivers or lakes. Some groups have members that include both marine and land (or terrestrial) species. For example, sea otters are considered marine mammals but are in the same family as skunks and weasels which are strictly land animals. Most bears are not classified as marine mammals, but polar bears are. They spend a great deal of their lives in the sea and are listed as a protected marine mammal under the Marine Mammal Protection Act of 1972, as are all the animals given below.

Classification:

Kingdom : Animalia (Animals)
Phylum : Chordata (Animals with notochords)
Subphylum: Vertebrata (Vertebrates)
Class : Mammalia (Mammals)
There are four orders

1.Order :Cetacea (Cetaceans)
i)Suborder: Odontoceti (Toothed Cetaceans)
Family: Physeteridae - Sperm Whales
Family: Ziphiidae - Beaked Whales
Family: Delphinidae - Marine Dolphins
Family: Platanistidae* - Freshwater Dolphins

Family: Phocoenidae - Porpoises

Family: Monodontidae - Belugas & Narwhals

ii)Suborder : Mysticeti (Baleen Whales)

Family: Balaenopteridae - Rorquals

Family: Balaenidae - Right Whales

Family: Eschrichtiidae - Gray Whales

2.Order : Pinnipedia (Pinnipeds)

Suborder: None

Family: Phocidae - True or Earless Seals

Family: Otariidae - Sea Lions or Eared Seals

Family: Odobenidae - Walruses

3.Order : Sirenia* - Dugongs & Manatees

Suborder: None

Family: Dugongidae* - Dugongs

Family: Trichechidae* - Manatees

4.Order: Carnivora* - Carnivores

Suborder : None

Family: Mustelidae* - Sea Otters

Family: Ursidae* - Polar Bears

Whales, Dolphins and Porpoises

The members of the Order Cetacea, are broadly grouped into two sub-orders viz. Mysticeti and Odontoceti.The members of the suborder Mysticeti are all toothless whales where as the members of the Odontoceti are toothed whales. The members of the suborder Mysticeti are also known as baleen whales as they posses numerous baleen plates on the roof of their mouth, which is very stiff and keratinized, the same is used for the filtration of the smaller fishes and krills from large volumes of water. The toothed whales are the hunters and grasp prey such as fish and

squid, which are then swallowed whole. Toothed whales also have a single external blowhole, while baleen whales have two blowholes.

Baleen whales are generally large, with females growing larger than males. The smallest is the pygmy right whale (about 7 m long) and the largest is the blue whale (also the largest animal on the earth) above 33 m in length and 160 tonnes in weight. Baleen whales are batch feeders, taking in greater volumes of water in a single gulp, and then with fringes of baleens filter the small crustaceans and fishes as well as invertebrates from the water. After filtering, the filtered food items are swallowed by licking the baleen fringes using tongue. Almost all mysticetes are known to make long-range seasonal migrations. Baleen whales are known to comprise four families namely balaenidae, neobalaenidae, balaenopteridae and eschrichtiidae. In Indian waters, baleen whales are represented only by Balaenopteridae.

The members of the family Balaenopteridae are also called as rorquals, which have throat groves.In India about six species are represented, namely, Balaenoptera musculus (Blue whale), B.physallus (fin whale), B.borealis (sei whale), B.edeni (Bryde's whale), B. acutorostrata (minke whale)and Megaptera novaeangliae (Humpbacked whale). The members of the family Eubalaenidae are called as right whales, which have thicker bodies and lack throat grooves.

The right whales (Eubalaena spp.) are baleen whales with bow-shaped lower jaw and a head that is up to one-quarter of the body length. The head is hairier than most whales; up to 300 hair are found on the tip of the lower jaw and 100 on the upper jaw. There are also callosities (a series of horny growths) behind the blowhole, on the chin, above the eyes, on the lower lip, and on the rostrum (the beak-like upper jaw). Right whales are similar to bowhead whales, but smaller. Right whales were named by whalers who considered them the "right" whales to hunt, since they are rich in blubber, are easy to catch (they are relatively slow swimmers) and they float after being killed.Right whales are skimmers, filter feeders that swim slowly with their mouth open, constantly eating. Occasion, by they are also bottom feeders, eating benthic prey from the mud on the ocean floor. The fine baleen hair can filter out very tiny prey including copepods, euphasiids and mysids (tiny crustaceans).

The family Eschrichtiidae has only one member, which is often called as grey whale. Gray whales are the only benthic-feeding whales; they dredge the seafloor with their jaws and then expel the muddy water out, using their baleen to filter out the bottom-dwelling amphipods and

other crustaceans. Gray whales feed only during the summer when they are in the Bering, Chukchi and Beaufort seas. The rest of the year, gray whales live off their reserves.

There are 66 species, or kinds, of toothed whale, grouped under several families. Some toothed whales are: Sperm, Bottlenose, Orca, Pilot, Narwhal, and Beluga whales, and dolphins and porpoises.

Almost 90% of cetaceans are toothed whales. They are generally smaller than baleen whales Males are generally larger than females. Most toothed whales are dolphins and porpoises, but there are a few large toothed whales such as Orca, or killer whale, and the sperm whale. Almost all toothed whales, including porpoises and dolphins, use echolocation. Echolocation means o emitting sound waves listen for the echo of the sound waves from it surroundings. Echolocation helps toothed whales and know their surroundings and find food.

Toothed whales are believed to be among the most intelligent animals on earth. The intelligence of dolphins, Beluga and killer whales has been shown in captivity, and sperm whales have the largest brain of any animal. The sperm whales have a mass of fatty tissue lying above the skull known as spermaceti. This species is known to produce a solid mass of waxy substance known as ambergris. These sperm whales are present in the warmer parts of the oceans and feed mainly on larger forms such as squids.

The largest toothed whale is the sperm whale, about 18 m long. It is thought to dive deeper than any other cetacean. The Pygmy sperm whale and Dwarf sperm whales are much smaller, though similar in appearance. One of the smallest toothed whales is Hector's dolphin, about 1.3 m. The largest group of toothed whales are the dolphins and porpoises.

The common dolphin Delphinus delphis cosmopolitan distribution is fished commercially around Japan and in the Black Sea. The killer whale is also a cosmopolitan member of the dolphin family. As the name implies, they are the most voracious of all animals, preying on fishes, walruses, seals, other dolphins and porpoises and even whales of all sizes.

Most dolphins live in the oceans, but a few live in fresh water. There are four species, or kinds, of dolphins called river-dolphins. As their name suggests, they live only in rivers. They all have a long, slender beaks with many teeth. They have small eyes. Their dorsal fins are less developed than those of ocean dolphins, and their bodies are thicker. They live in muddy river

estuaries (where a river meets the sea) and rely on excellent echolocation in order to find their way about.

The existing river-dolphin species are:

- the Indian river-dolphin – Platanista gangetica , P. gangetica minor (sometimes known as indus or Ganges river-dolphin),

- the Amazon river-dolphin (called boto), Inia geoffrensis

- the La Plata dolphin, Pontoporia blainvillei

All river-dolphins are now considered as threatened or endangered.

Cetaceans are most often identified on the basis of the shape and size of the blow hole; colouring and pigmentation; the presence, shape and size of the dorsal fin; and shape of the tail flukes—though general behaviour and seasonal occurrence of the animal(s) also provide some clues.

Whales display a wide range of activities in coastal waters, including blowing, breaching (jumping clear of the water), spyhopping (raising the head from the water to look around), fluking-up (raising the tail flukes from the water), lob tailing (slapping the water with the flukes) and flippering (waving or slapping a flipper on the water). Cetaceans travel singly or in groups, called pods, characteristic of the species. Toothed whales usually travel in pods of six to eight individuals, while Harbour Porpoises are usually alone or in pairs. Large pods of up to 2000 Saddleback Dolphins and 500 Pilot Whales and White-sided Dolphins have also been observed. Like all other mammals, cetaceans are warmblooded, breathe air and feed their young on milk. Because they are warm-blooded, unlike fish, they must spend a lot of energy maintaining body temperature when in cooler waters. Hearing is the most important sense for cetaceans. Besides communication and feeding, it has been suggested that their highly specialized systems of sound production may be important for navigation.