CHAPTER 39

Taxonomy of Marine Mammals

INTRODUCTION

Marine mammals are warm-blooded aquatic vertebrates belonging to the class Mammalia, breathe air through lungs, locomotion by fins & flippers and produce milk to nurse their young ones. They are classified into four different taxonomic groups: **cetaceans** (whales, dolphins, and porpoises), **sirenians** (manatees and dugong), **pinnipeds** (sea lions, walrus, and seals) and **fissipeds** (sea otters and polar bear). They have undergone major adaptations which permit them to live in water with extreme temperature, depth, pressure, and darkness. The adaptations are the loss of hind limbs (cetaceans and sirenians), use of limbs for propulsion through water (pinnipeds), and the general streamlining of the body for hydrodynamic efficiency. Structural modifications to the sea otters and the polar bear are less apparent in body form and they continue to closely resemble their terrestrial counterparts. While cetaceans and sirenians spend their entire lives in the water, other marine mammals come ashore for various reasons, at particular times in their lives[1].

Marine mammals are often referred as "ocean sentinels" and ecosystem indicators of productivity and biodiversity. They are considered as keystone species in the marine ecosystem where their population collapse has a cascade effect in the food web which can eventually affect the human communities. Due to wide distribution, large body size, and predatory nature, marine mammals exert a major influence on marine food webs and on the structure and function of marine ecosystems. These organisms are known to inhabit tropical, subtropical, temperate, and polar oceans and seas as well as estuaries and contiguous seas of the world's large rivers. Marine mammals have a crucial role in determining the behaviour and life history traits of prey species and predators, as well as nutrient storage and recycling, and habitat modification in benthic environments[2]. With the push on the blue economy in India, there is an urgent need to assess and monitor marine mammal populations and characterise their habitats to better understand their biology, behaviour, and potential impacts from anthropogenic activities and environmental change.

In recent times marine mammals face a wide range of threats including incidental killing of their coastal populations as a result of entanglement in fishing gear, collisions with powered vessels, and entrapment in water regulation devices, pollution, ocean acidification, stresses due to infectious diseases and harmful algal blooms, disturbances due to seismic activities and ocean warming[4]. Conservation and sustainable management of this highly valuable resource is important for maintaining and restoring the distribution, abundance and diversity of marine

R Ratheesh Kumar, R Rahul, Kuberan Ganesan, Pradip N Chogale and E Vivekanandan *ICAR-Central Marine Fisheries Research Institute, Kochi, Kerala*

mammals and thus for healthy ocean. Taxonomy is the basic tool in conservation of living resources. Units of conservation is determined by population structure and ultimately by species designation.

Identification of marine mammals includes several methods like morphology based classical taxonomy, acoustics detection by comparing the sound frequencies and modern tools such as molecular identification of marine mammals by application of DNA barcoding (COI, 16S rRNA), mass spectrometry (collagen peptide mass fingerprinting) and eDNA (droplet digital PCR). Next-Gen Sequencing (NGS) has been applied frequently on present cetacean populations recovering full mitogenomes, genomic single nucleotide polymorphisms (SNPs), or even complete nuclear genomes to develop more nuanced models of their evolutionary systematics and population histories. Some of the current areas of molecular research on cetaceans globally are, DNA barcoding[5], eDNA analysis[6], whole genome sequencing[7], mitogenomics[8] and molecular identification of market samples[9]. Even though molecular approaches are successful in identifying marine animals, they are expensive and due to difficulty in getting fresh tissue samples, researchers commonly use morphology-based visual identification.

Marine mammal specimens can be identified by using morphological characters, such as ratio of the outer margin of the flipper to the total body length, coloration pattern, teeth count, shape of body, shape of head, extent of throat grooves, shape of flipper, position and shape of dorsal fin, shape of caudal fluke, body colour, position of blow holes etc. and in visual surveys, blow pattern is a key feature of species identity. Photographs of dorsal fins and flukes help in identification of individual cetaceans and this technique, known as photo-identification, is useful for studying the school size, structure and species composition. A repeated photo-session from the same geographical location for a protracted period of time will help in monitoring resident and migrant populations as well as the reproductive success. Identification of the species at sea is somewhat different from that of a dead animal on land. Even under ideal conditions, an observer often gets little more than a brief view of a splash, blow, dorsal fin, head, flipper, or back, often from a great distance[1].

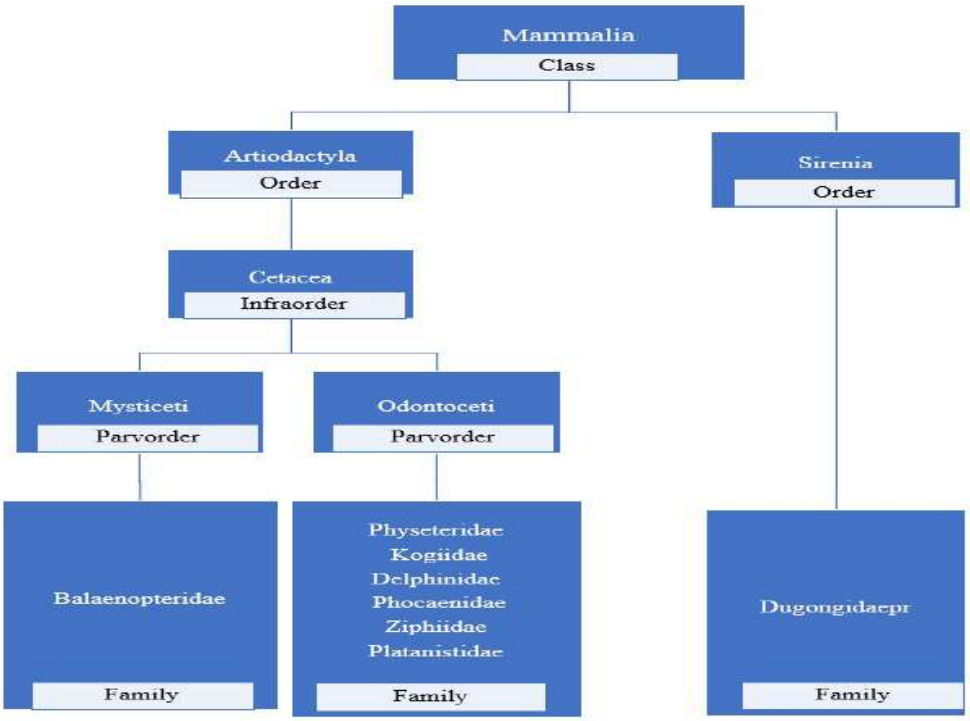
Marine mammals comprise of 21 families (8 are monotypic) and 135 recognized species in the world belonging to four taxonomic groups i.e., cetaceans (whales, dolphins and porpoises), sirenians (manatees and dugongs), pinnipeds (seals, sea lions and walruses), and marine fissipeds (polar bears and sea otters) [10]. IUCN has listed 25% of these species as threatened (IUCN, 2009), and many species are expected to become extinct if proper management and conservation measures are not taken[11].

MARINE MAMMAL DIVERSITY OF THE WORLD[10]

Order	Infraorder	Parvorder	Family	No. of Species
Carnivora (38)	Arctoidea (3)	Ursida	Ursidae	1
		Mustelida	Mustelidae	2
	Pinnipedia (35)		Otariidae	15
			Odobenidae	1
			Phocidae	19
Artiodactyla (92)	Cetacea (92)	Mysticeti (15)	Balaenidae	4
			Neobalaenidae	1
			Eschrichtiidae	1
			Balaenopteridae	9
		Odontoceti (77)	Physeteridae	1
			Kogiidae	2
			Ziphiidae	23
			Platanistidae	2
			Iniidae	1
			Lipotidae	1
			Pontoporiidae	1
			Monodontidae	2
			Delphinidae	37
			Phocoenidae	7
Sirenia (5)			Trichechidae	3
			Dugongidae	2
Total				**135**

CLASSIFICATION OF MARINE MAMMALS OF INDIA

In the Indian seas, the marine mammals are represented by cetaceans and sirenians, and they together contribute 28 species[12, 4], comprises almost 25 percentage of the world's marine mammals, and almost 8% of all mammalian fauna recorded in India[13]. The sirenian group in India is represented by a single species, *Dugong dugon*. The Wildlife (Protection) Act 1972 of India listed all the marine mammal species under Schedule I.



ORDER: ARTIODACTYLA

INFRAORDER: CETACEA[14]

- All cetaceans share a similar streamlined body structure
- Nostril(s) on the top of the head make up the blow hole, with one in odontoceti and two in mysticeti
- Propulsion by up and down movement of tail ends with a flattened paddle like cartilaginous fluke
- Telescoping in skull- restructuring process that pushed the nasal passages posteriorly in the cetacean skull[15]
- Body is enfolded in well-developed blubber layer
- Newly derived boneless structures in the form of tail flukes and a dorsal fin or ridge

PARVORDER: MYSTICETI (BALEEN WHALES) [16]

- This group having the largest animal on the planet. Antarctic blue whale, weighing up to 181 tonnes (approximately 33 elephants) and reaching up to 98 feet in length
- Paired nostrils or blowholes are longitudinal slits situated at the top of the cranium causing a V-shaped blow
- Wing like flipper movement helps in the propulsion of the body
- Presence of baleen (keratinaceous baleen plates (or "whalebone")) instead of teeth in their mouths to sieve planktonic creatures from the water
- Indian baleen whales are represented by the family Balaenopteridae

KEY CHARACTERISTICS FOR WHALE IDENTIFICATION

- Shape of head
- Shape and location of dorsal fin
- Body color and pattern
- Baleen plates colour
- Number of ventral (throat) grooves
- Flipper length and shape
- Girth to length ratio
- Head length to body length ratio

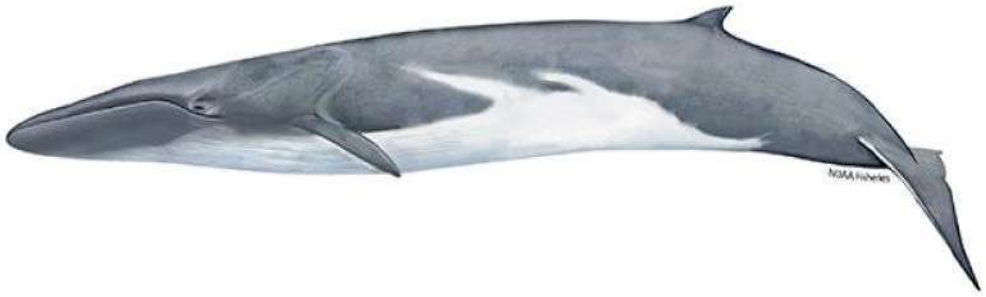
FAMILY: BALAENOPTERIDAE

- Members of this family also known as rorquals, contains the gigantic animals ever to live
- In India Balaenopteridae comprises 6 species belonging to 2 genera: Balaenoptera and Megaptera
- Except the humpback whale other members shares a streamlined body with a series of long pleats from the snout tip to as far back as the navel on the ventral surface
- Lunge feeding is an extreme, fast and active feeding method, their morphology allows them to accelerates to a high velocity and then open their jaws wide and distend their throats to take in huge mouthful of water during feeding
- The baleen plates are of moderate length and fringe fineness. Density and fringe diameter- vary among species, and along with plate number and width to length ratio, are diagnostic characters
- Dorsal fins situated behind the midpoint of the back at $2/3^{rd\ to}$ $3/4^{th}$ of total length.
- Pleated throat grooves distinguish balaenopterids from other whales.

BALAENOPTERA MUSCULUS (LINNAEUS, 1758) - Blue whale

- Dorsal fin very small (about 1% of body length) and positioned at 3⁄4 of total length
- 260 to 400 black baleen plates with black bristles per side (all 3 sides of each plate roughly equal in length)
- Bluish or light grey body colour with grey patches on dorsal surface
- 60-80 ventral grooves extending near to navel
- Maximum body length: 33 m.
- Most adults measuring 23 to 27 m and newborn measuring about 7-8 m
- IUCN status: Endangered

BALAENOPTERA PHYSALUS (LINNAEUS, 1758) - Fin whale

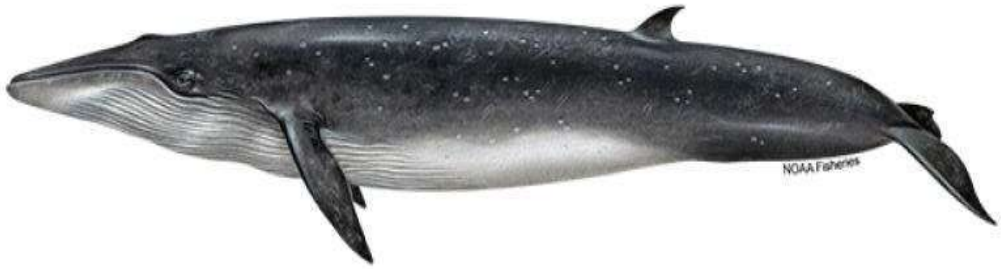


- Head V-shaped from above, and pointed at the tip
- A ridge on the upper side of mouth and another prominent ridge between dorsal fin and fluke
- 260 to 480 grey baleen plates with white streaks on the side
- Head coloration asymmetrical (left side grey, much of right side white); back dark, with light streaks; belly white
- Tall and falcate dorsal fin positioned farther forward on caudal peduncle
- 50-100 ventral grooves extending up to naval
- Adults reach a maximum size of 27 m in southern hemisphere and 24 m in the northern hemisphere
- IUCN status: Vulnerable

BALAENOPTERA BOREALIS LESSON, 1828- Sei whale[17]

- The rostrum is pointed, snout slightly down and turned at tip
- The pectoral fins are relatively short, only 9%–10% of body length, and pointed at the tips
- Ventral pleats 32 to 60, longest ending past flippers, but well short of navel
- 300 to 380 pairs of black baleen plates with many whitish bristles, less than 80 cm long
- Flippers are all dark
- A single median ridge
- Maximum body length 19.5 m
- IUCN status: Endangered

BALAENOPTERA EDENI ANDERSON, 1878- Bryde's whale



- Pointed head with three prominent ridges on dorsal side of rostrum
- 40 to 70 ventral pleats extending to umbilicus
- 250 to 370 slate-grey baleen plates per side; with white to light grey fringes
- Head coloration symmetrical
- Tall and well falcate dorsal fin
- Dorsal profile is dark gray and light ventrally
- Tip of the lower jaw is dark
- Maximum body length 14 m
- IUCN status: Least Concern

BALAENOPTERA ACUTOROSTRATA LACEPEDE, 1804- Common Minke whale

- Sharply pointed and V-shaped head with prominent ridge on upper rostrum
- Tall and falcate dorsal fin; located at two third of body
- Dark grey with shades on lateral side of body
- 50-70 throat grooves extending just past the flippers
- 231 to 360 cream coloured baleen plates with coarse bristles per side, less than 21 cm long, mostly white or yellowish white (sometimes with dark margin along outer edge); often conspicuous white bands on upper surface of flippers
- Head sharply pointed from above; maximum body length 9 m
- IUCN status: Least Concern

MEGAPTERA NOVAEANGLIAE (BROWSKI, 1781) - Humpback whale

- Robust and stocky body
- Top of head covered with knobs, 1 prominent cluster of knobs at tip of the lower jaw
- Prominent tubercles near the lips and chin
- Elongated flippers one-fourth to one- third of body length, with knobs on leading edge
- Small dorsal fin usually at top on an obvious hump
- Black and dark grey in colour
- 14-35 ventral grooves extending beyond navel
- 270 to 400 black to olive brown baleen plates with grey bristles per side, less than 80 cm long
- Flukes with irregular trailing edge

- Maximum body length 16m
- IUCN status: Least Concern

PARVORDER: ODONTOCETI (TOOTHED WHALES) [18]

- Represented by 6 families (India)
- These are small to medium sized cetaceans except sperm whales (male of which can grow at least 18 m)
- Presence of teeth throughout life
- Single blow hole
- An asymmetrical skull with
  - Concave profile
  - Sternum with 3 or more parts
  - Complex system of nasal sacs
  - Fatty organ in the forehead area called the melon
- Capable of echolocation to
  - Navigate
  - Find food
  - Avoid predators

FAMILY: PHYSETERIDAE (SPERM WHALES) [19]

- The sperm whales are the largest toothed cetacean
- There is a low dorsal hump, followed by a series of crenulations
- Has a large head with a squarish profile, narrow underslung lower jaw, and functional teeth only in the lower jaw (these fit into socket in the upper jaw)
- Caudal flukes are triangular and very thick
- Blowhole located at the left front of the head
- Head is divided into sections called the "junk" and the spermaceti organ or "case"
- The spermaceti: is large oil filled reservoir
- Capable of very deep and long dives

PHYSETER MACROCEPHALUS (LINNAEUS, 1758) - Sperm whale

- Head squarish and large, 20 to 30 % of body length
- Narrow lower jaw
- Short and broad flippers
- Small, thick and round dorsal hump followed by a series of crenulations along the midline
- 18-26 pairs of teeth in only lower jaw, fitting into sockets in upper jaw
- Body black to charcoal grey, with white lips and inside of mouth
- 2-10 short throat grooves present

- S- Shaped blowhole at left side of front of head
- Maximum size: 18 m
- IUCN status: Vulnerable

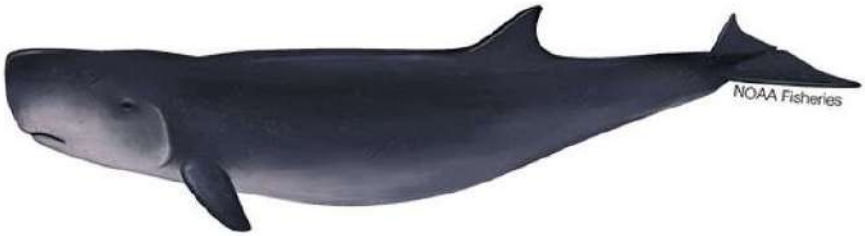
FAMILY: KOGIIDAE[20]

- Blunt squarish heads not more than 15% of the body length with very short rostrum
- Blowhole is not located at the front of the head
- Dorsal fin is larger than the sperm whale
- 8 to 16 long thin and sharply pointed homodont teeth in each side of lower jaw, fitting into upper jaw sockets
- Similar to that of sperm whales, Kogiidae also possess spermaceti in their head
- Body size less than 4 m

KOGIA BREVICEPS (BLANINVILLE, 1838) - Pygmy sperm whale

- Tiny underslung lower jaw
- Small and sqaurish head
- A hump on dorsal side between blowhole and dorsal fin
- Well curved dorsal fin and set behind the midpoint of the body
- Flipper set near to head
- Throat creases generally absent; dorsal fin short (< 5% of body length)
- Distance from tip of snout to blowhole greater than 10.3% of total length
- 12 to 16 (rarely 10 to 11) sharp fang-like teeth in each half of lower jaw
- Maximum body length:3.5 m
- IUCN status: Least Concern

KOGIA SIMA OWEN, 1866- Dwarf sperm whale



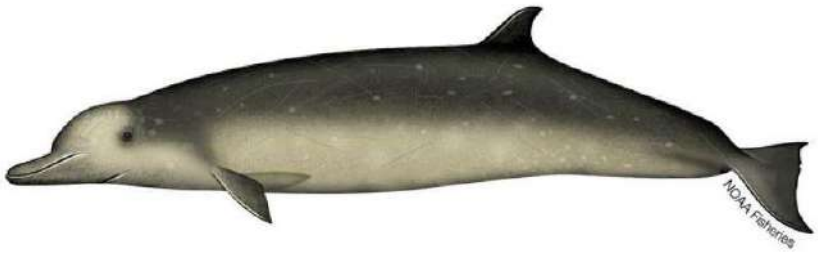
- Tiny underslung lower jaw
- Triangular or squarish head

- No hump on dorsal side between blowhole and dorsal fin
- Tall and slightly falcate dorsal fin
- A pair of short throat grooves
- Small flipper with blunt tip positioned near head
- Sharp fang-like 7-12 pairs of teeth present on lower jaw
- Distance from tip of snout to blowhole greater than 10.2% of the total length
- Maximum body length 2.7 m
- IUCN status: Least Concern

FAMILY: ZIPHIIDAE

- Beaked whales are medium size cetaceans (4 to 13 m long)
- Have a pronounced beak in general
- Relatively small dorsal fin set far back on the body
- Small flippers that fit into depressions on the sides
- A pair of converging grooves under the throat, and the notch is absent in the tail fluke.
- Not more than 1 or 2 pairs of exposed teeth in the lower jaw of males only
- The blubber of these whales is predominantly composed of wax ester, a unique characteristic of this family[21]

INDOPACETUS PACIFICUS -Longman's beaked whale



- Large and robust body
- Bulging foreheads and moderate tube beaks
- Beak with single pair of oval teeth at tip of the lower jaw
- Large and falcate dorsal fin located behind the midpoint of body
- Broad flukes with straight trailing edges
- Small and blunt flipper
- A pair of V shaped grooves on the throat
- Umber brown to bluish colour
- Maximum size :6m
- IUCN status: Least Concern

ZIPHIUS CAVIROSTRIS CUVIER, 1823 - Cuvier's beaked whale

- Slender and relatively robust body than other beaked whales
- Relative to body size head is short and poorly distinct beak
- Forehead smoothly sloping, slightly concave in front of blowhole
- Light rusty brown with lighter area around the head
- Mouth line gently upwards
- Small and rounded flipper
- Single paired V-shaped throat grooves
- Small falcate dorsal fin set near to hind end of the body
- A single pair of teeth directed forward and upward at tip of lower jaw (exposed only in adult males)
- Maximum body length 6 m
- IUCN status: Least Concern

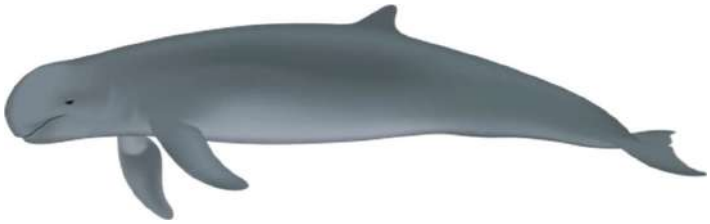
KEY CHARACTERISTICS FOR IDENTIFICATION OF DOLPHINS

- Shape and location of dorsal fin
- Shape of flipper
- Shape of head
- Colour and pattern of body
- Teeth count

FAMILY: DELPHINIDAE[22]

- Many small to medium sized odontecetes of various forms have been lumped together in this group, and so the family has been referred to as "taxonomic trash basket" range in size from the 1 to 10 m
- Most delphinids share the following characteristics
  - Marine habitat
  - A noticeable beak
  - Conical teeth
  - A large falcate dorsal fin set near the middle of the back.

ORCAELLA BREVIROSTRIS (GRAY, 1866) - Irrawaddy dolphin



- Moderately robust body
- Blunt, bulbous head with no beak and straight mouthline
- Dorsal groove between neck to falcate dorsal fin
- Dorsal fin set just behind the midpoint of the body
- Indistinct neck crease
- U-shaped blow hole open towards front
- Gray colour on dorsal and lateral side with white belly
- 8 to 19 pairs present in the upper jaw and 11-18 in lower jaw
- Maximum size 2.4 m
- IUCN status: Endangered

ORCINUS ORCA (LINNAEUS, 1758) - Killer whale

- Robust and spindle shaped body
- Very tall and straight erect or triangular dorsal fin in male and slightly shorter falcate dorsal fin with pointed or round tip in female
- White oval shape patches behind eyes; a light gray saddle patch behind dorsal fin
- Large and oval shaped flipper with blunt tips
- Peculiar black and white coloration, with post ocular patches, white lower jaw, white ventrolateral field and light grey saddle patch behind dorsal fin
- 10 to 14 pairs of large oval teeth in each tooth in each jaw
- Maximum body length 8 m
- IUCN status: Data Deficient

PSEUDORCA CRASSIDENS (OWEN, 1846) - False killer whale

- Long and slender and cigar shaped body
- Rounded and overhanging melon with no discernible beak
- Dorsal fin moderately height with rounded tip
- Flipper slightly curved with distinct hump on leading edge located near midpoint of back
- Body predominantly dark grey or black
- 7 to 12 pairs of large teeth in each half of both jaws
- Maximum body length 6 m
- IUCN status: Near Threatened

PEPONOCEPHALA ELECTRA (GRAY, 1846) - Melon headed whale

- Moderately robust body
- Head triangular and sharply pointed bulbous
- Extremely short, indistinct beak may be present in younger animals
- Faint cape that dips low below tall and falcate dorsal fin
- Lip of lower jaw white
- Body is coloured charcoal gray to black with a white urogenital patch
- 20-25 pairs of teeth per side of each jaw
- Flippers are sickle shaped with sharply pointed tips
- Maximum body length 2.75 m
- IUCN status: Least Concern

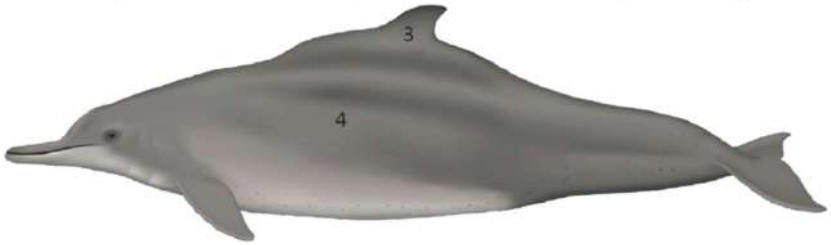
FERESA ATTENUATA -Pygmy killer whale[23]

- Short and rounded head
- Body colour is dark gray to black on the cape and has a sharp change to lighter gray on the sides
- White patches on belly and lips of jaw white
- Rounded tipped dorsal fin
- Higher teeth count, they have approximately 48 teeth, with 22 on the upper jaw and 26 on the lower jaw
- IUCN status: Least Concern

SOUSA CHINENSIS (OSBECK, 1765) - Indo- Pacific humpback dolphin

- Robust body grey with bluish, cream, or pink tinge and light belly
- Long and well-defined beak, but no distinct crease
- Dorsal fin is small and wide based placed on a mid-dorsal hump
- Dorsal ridge is absent
- Light coloured calves become grey or brown when they are adults
- 31- 39 pairs of teeth in upper jaw and 29-38 pairs in lower jaw
- Maximum size to 2.5 m
- IUCN status: Vulnerable

SOUSA PLUMBEA (G. CUVIER, 1829) – Indian Ocean humpback dolphin



- Robust body
- Long well-defined beak
- Small dorsal fin sits on a dorsal hump
- Colour: brown/grey, sometimes with white/pink on dorsal fin
- Teeth: upper jaw 33-39 in each tooth row, 31-37 lower jaw
- Maximum size to 2.8 m
  IUCN status: Endangered

STENO BREDANENSIS (LESSON, 1828) - Rough toothed dolphin

- Robust body, dark grey to black above and white below, with many scratches and spots
- Long and conical head
- No distinct crease between melon and long beak
- Dark grey cape below slightly falcate dorsal fin
- Belly, lips and lower are white in colour with spots
- Flippers very large and set farther back
- 19 to 28 slightly wrinkled teeth in each half of both jaws
- Maximum body length: 2.5 m
- IUCN status: Least Concern

GRAMPUS GRISEUS (CUVIER, 1812) - Risso's dolphin

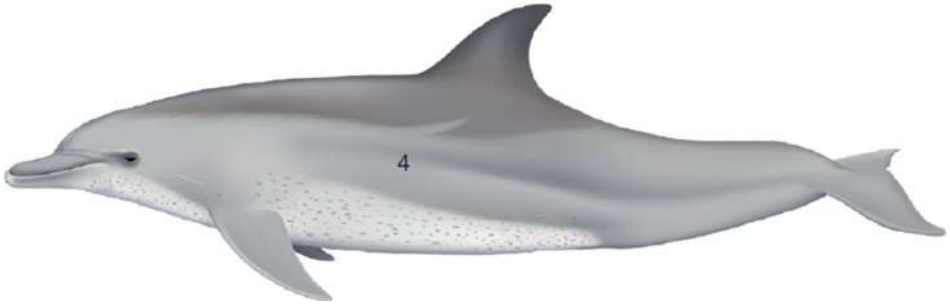
- Robust body

- No beak and blunt head and vertical crease on front of melon
- Very tall, slender and dark falcate dorsal fin pointed at tip
- Mouthline slopes upwards
- 2 to 7 pairs of teeth at front of lower jaw only (1 to 2 pairs in upper jaw), but teeth may be absent or extensively worn
- Body grey to white, covered with scratches and splotches in adults and young ones relatively unmarked
- Flippers long, pointed and sickle shaped
- Maximum body length 3.8 m
- IUCN status: Least Concern

GLOBICEPHALA MACRORHYNCHUS GRAY,1846 -Short-finned pilot whale

- Bulbous and round head with up sloping mouth lines with short or no prominent beak
- Long and sickle shaped flipper
- 7 to 9 pairs of short sharply pointed teeth present
- Round and broad base dorsal fin situated near to fore end of the body
- Black in colour and white cape below dorsal fin
- Adult grow up to 5 m
- IUCN status: Least Concern

TURSIOPS ADUNCUS (EHRENBERG, 1833) – Indo-Pacific bottlenose dolphin



- Moderately robust body
- Short beak set of by distinct crease
- Tall, slightly falcate and broader dorsal fin

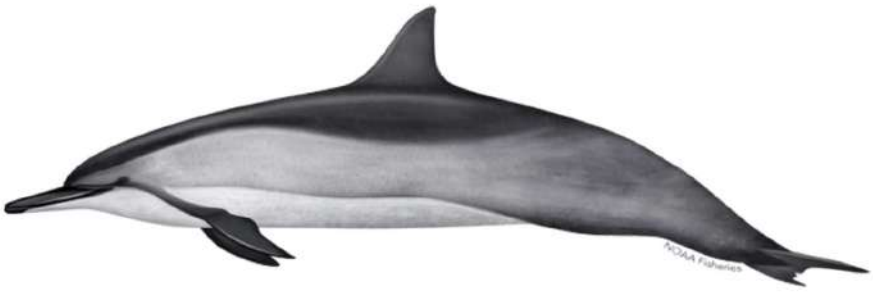
- Gray body with white belly. Prominent black spots or flecks on bellies
- 20 to 26 teeth in each half of upper jaw, 18 to 24 in lower jaw
- Body length to 2.7 m
- IUCN status: Near Threatened

STENELLA ATTENUATA (GRAY, 1846) - Pantropical spotted dolphin

- Fairly slender body
- Long slender beak with white tip separated from melon by a distinct crease
- Slender and strongly curved flipper. Dark stripe from gape to flipper
- Narrowly curved falcate dorsal fin with pointed tip
- Body spotted heavily

- Dark grey band between eye to apex of melon
- Adults with light to extensive spotting and grey bellies (spotting sometimes absent)
- 34 to 48 teeth in each jaw
- Maximum size 2.1 m
- IUCN status: Least Concern

STENELLA LONGIROSTRIS (GRAY, 1828) - Spinner dolphin



- Slender body
- Long and slender beak with black tip
- Erect and triangle or slightly falcate dorsal fin located in mid of the body
- Dark grey cape and followed by light grey sides and white belly
- Dark strip present between eye and origin of flipper
- 40 to 62 very fine sharply pointed teeth per tooth row.

- Maximum size 1.8 m
- IUCN status: Least Concern

STENELLA COERULEOALBA (MEYAN, 1833) - Striped dolphin

- Moderate snout and black in colour
- Moderate beak length, distinct crease between melon and beak
- Prominent dark stripes from eye to anus and eye to flipper
- Colour pattern black to dark grey on back, white on belly
- Light grey spinal blaze extending to below dorsal fin (not always present)

- Shallow palatal grooves often present
- 40 to 50 pairs of slender and pointed teeth present in each jaw
- Maximum size 2.4 m
- IUCN status: Least Concern

DELPHINUS CAPENSIS (GRAY, 1828) – Long-beaked common dolphin

- Elongated rostrum, deep crease present between beak and melon.
- A distinctive V shape present below the tall and slightly falcate dorsal fin
- Stripe extent from chin to origin of flipper
- Flipper is recurved and pointed at tips
- Back dark and belly white
- Tan to buff thoracic patch and light grey streaked tail stock from an hourglass pattern that crosses below dorsal fin

- 47 to 67 sharp and pointed teeth in each jaw; palate with two deep longitudinal grooves
- Maximum size 2.4 m
- IUCN status: Data Deficient

FAMILY: PLATANISTIDAE[24]

- Includes the extant susu and the bhulan of the Ganges and Indus rivers, respectively
- Long forceps like beak, with front teeth that extend outside the closed mouth
- Blowhole is a longitudinal slit
- Instead of a true dorsal fin a short dorsal ridge is present

PLATANISTA GANGETICA (ROXBURGH, 1801) - Ganges River dolphin[24]

- National aquatic animal
- Body tan, chocolate brown or light blue with lighter or pinkish belly
- Slit like single blowhole
- Long beak with sharp and pointed teeth protruding outside closed mouth at front half
- 26 to 39 teeth in each row
- It has a rectangular, ridge like dorsal fin
- Reach maximum size up to 2.5 m
- IUCN status: Endangered

FAMILY: PHOCOENIDAE[18]

- They are small cetaceans generally coastal in distribution with no prominent beak
- Streamlined body and two limbs that are modified into flippers
- Spade-shaped teeth distinguished from the conical teeth of dolphins
- Short triangular shaped or no dorsal fin
- Exhibit sexual dimorphism in which females are larger than males

NEOPHOCAENA PHOCAENOIDES (CUVIER, 1829) - Finless porpoise

- Round forehead rises steeply from the snout tip, devoid of beak
- True dorsal fin is absent, but there is a narrow dorsal ridge covered in thick skin bearing several lines of tiny tubercles
- Tiny bumps on dorsal side behind forehead
- Body colour is grey or black, with lighter belly
- 15 to 22 teeth present in each jaw
- Flipper with large rounded tips
- Fluke with concave trailing edge
- Maximum size of 1.7 m
- IUCN status: Vulnerable

ORDER: SIRENIA[25]

- These are herbivorous group of marine mammals
- Robust fusiform body with tough and thick skin bearing short hair
- They have heavy bones that act as ballast to counteract the buoyancy of their blubber
- 2 nostrils present on top or at the front of a thick muzzle
- External ear pinnae and hind limbs are absent
- Forelimbs modified as flippers
- Horizontally flattened tail; and dense and swollen bones

FAMILY: DUGONGIDAE

- There is only one extant species in the family
- Flattened tail is broadened into flukes similar to cetaceans
- Rostrum is deflected downwards, presence of erupted tusks in males
- Absence of nails on the flippers

DUGONG DUGON (MULLER, 1776) - Sea cow or dugong

- The sole sirenian species found in the Indo- pacific
- Streamlined body shape like cetaceans
- Valve like nostrils on top of snout
- Incisors present in the form of tusks
- Head with muzzle deflected downward ends in a “rostral disk” with short and dense bristles
- Dorsal fin is absent
- Smooth skin sprinkled with short hairs

- Paddle shaped flippers containing no nails, Tail spilt into flukes, with a median notch; tail stock laterally compressed into peduncle
- Maximum size- 3.3m
- IUCN status: Vulnerable

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