

ORDER MYSTICETI

This order contains the largest cetaceans, many of which have been the mainstay of the whaling industry for centuries. They differ from odontocetes in many respects (see below and p.247). Teeth, which are present as buds in the gums of embryos, degenerate and are replaced in adult mysticetes by baleen—a series of 100-400 transverse plates of hardened oral tissue of the palate that are suspended from each side of the upper jaw along the outer margins of the mouth. The plates are frayed on the inner surfaces, forming a filter. Water is taken into the mouth and forced out through the baleen as the mouth is closed, trapping planktonic organisms on the inside of the filter. The strained food is scraped from the baleen by the tongue with each closure of the mouth and is swallowed.

Many adaptations of baleen whales to an

aquatic environment are shared with odontocetes (see above, p.238).

Recognition Characters:

1. **no teeth** (except in embryos).
2. **baleen present.**
3. two external nasal openings (blowholes) present, slit-like.
4. **skull ± symmetrical.**
5. nasals roofing part of nasal passage.
6. **maxilla extending posteriorly as a long, narrow process, interlocking with frontal, not spreading outward over supraorbital process.**
7. lower jaws loosely joined by ligaments at symphysis.

Compare with: Odontoceti, Sirenia.

Remark: References to baleen whales are included with those listed above for cetaceans (p.239).

KEY TO FAMILIES OF MYSTICETI

- 1a. Body chunky; no longitudinal grooves in skin of throat; rostrum highly arched; posterior margins of nasal and premaxilla not extending backward beyond level of anterior margin of supraorbital process of frontal (see Fig. 113); maxilla without nasal process **BALAENIDAE** (p.241)
- 1b. Body slender; longitudinal grooves present in skin of throat; posterior margins of nasal and premaxilla extending backward beyond level of anterior margin of supraorbital process of frontal (see Figs. 114, 115); maxilla with nasal process 2
- 2a (1b). Dorsal fin present; throat grooves numerous; supra-occipital extending anteriorly beyond zygomatic process of squamosal (see Fig. 115); lower jaws conspicuously bowed outward **BALAENOPTERIDAE** (p.245)
- 2b. No dorsal fin; throat grooves few (2 to 4); supraoccipital not extending anteriorly beyond zygomatic processes of squamosal (see Fig. 114); lower jaws ± straight **ESCHRICHTIIDAE** (p.243)

Family BALAENIDAE (Right whales)

Early whalers coined the common name applied to this family because these whales (especially *Balaena glacialis*) were "right" for commercial harvesting: they are slow-moving and are very buoyant (an important consideration for early whalers since techniques for inflating carcasses were developed only recently), and they contain large quantities of oil and baleen (valued for many products, including lubricants and corsets, respectively).

These whales have a chunky body. The head constitutes roughly one-third of the body length. The mouth is huge. The baleen measures up to four meters long in the bowhead whale. The cleft of the mouth is long and curved.

Right whales prefer cooler temperate and subtropical seas. They occur singly or

in small groups. Their diet consists of planktonic crustaceans (krill) and molluscs. Females probably breed in alternate years; they bear a single calf.

All three species of balaenids are rare. The right whale (*B. glacialis*) is now strictly protected by international agreement.

Two genera, 3 species; all oceans except tropical seas.

Recognition Characters:

- head huge, making up about one-third of total length.
- 1. color dark gray to black (white patches on chin of *Balaena mysticetus*).
- 2. body chunky, robust (6-18.5 m).
- 3. dorsal fin absent (*Balaena*, right whales) or sickle-shaped (*Caperea*, pygmy right whale).

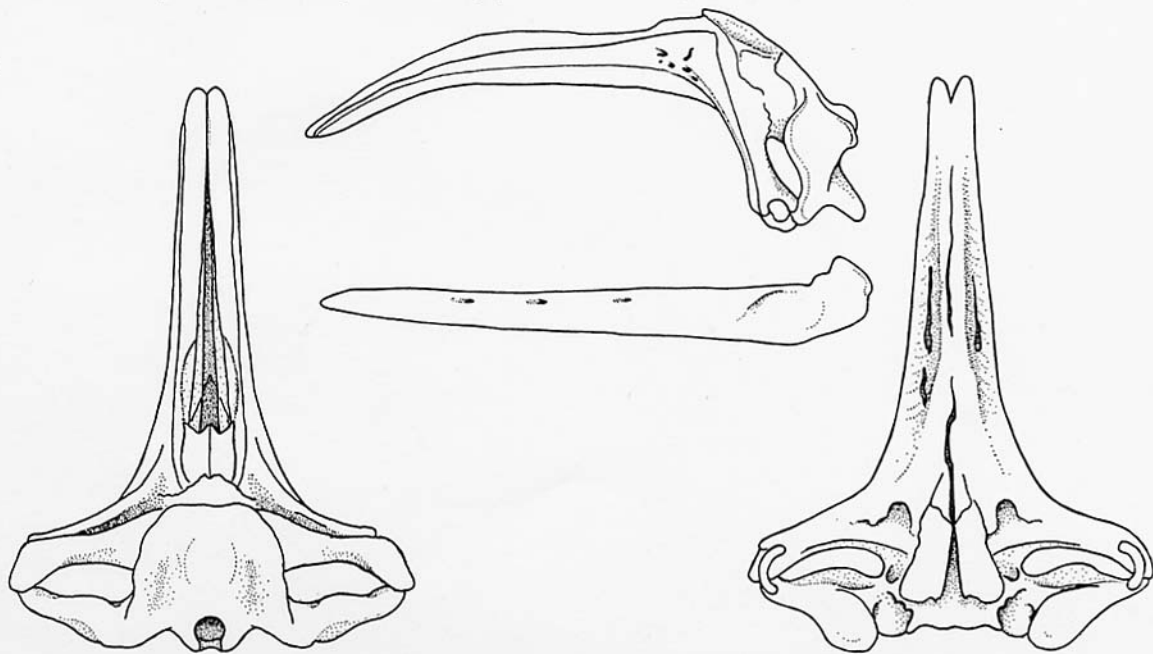
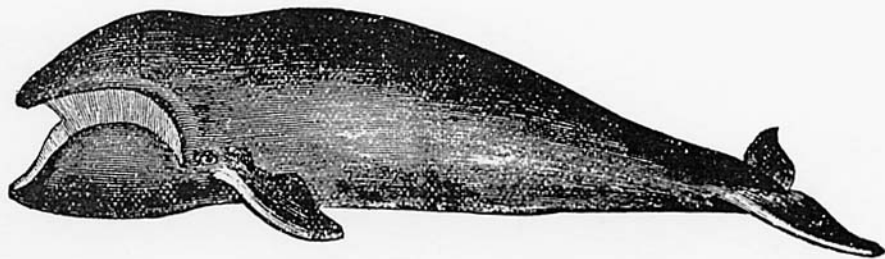


Figure 113. Skull of a balaenid (*Balaena*, x 1/50).

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3. dorsal fin absent (*Balaena*, right whales) or sickle-shaped (*Caperea*, pygmy right whale).
 4. **no longitudinal grooves in skin of throat.**
 5. **baleen plates long, narrow.**
 6. **rostrum long, narrow, highly arched** (Fig. 113).
 7. nasal small.
 8. **posterior margins of nasal and premaxilla not extending beyond level of anterior margin of supraorbital process of frontal** (Fig. 113).
 9. frontal scarcely visible at crest of skull (Fig. 113).
 10. **maxilla without elongate process extending posteriorly** (Fig. 113).
 11. anterior margin of parietal behind posterior margins of premaxilla, maxilla, and nasal (Fig. 113).
 12. supraoccipital extending anteriorly beyond zygomatic process of squamosal (Fig. 113).
- Dental formula: no teeth
- Compare with: Balaenopteridae, Eschrichtiidae.
- Representative Genus:**
- Balaena* (2) - *B. glacialis* and *B. mysticetus* are the right and bowhead whales, respectively.



Right whale.

Family ESCHRICHTIIDAE
(Gray whale)

The single species in this family is characterized externally by the absence of a dorsal fin and by a mottled appearance due to light blotches (skin discolorations or patches of barnacles) on a dark background. Gray whales have the least telescoped skull of all mysticetes (Fig. 114).

Members of this family are divided into two isolated stocks, one on each side of the North Pacific. They migrate from northern feeding areas to southern breeding grounds (confined to a few lagoons in Baja California and Korea) and back each year, a round trip of about 20,000 km (12,400 miles), the largest known annual migration of any mammal. They eat mostly

amphipods which they dredge from the mud of the sea floor.

Whalers nearly exterminated these animals from coastal waters of the eastern Pacific (North America) in the nineteenth century; the western Pacific stock has probably become extinct. Now strictly protected, the eastern stock probably exceeds 10,000.

One genus, 1 species; North Pacific, Chukchi Sea.

Recognition Characters:

1. body slender (11-15 m).
2. **color gray to black with white mottling.**
3. **dorsal fin absent** (small bumps present).

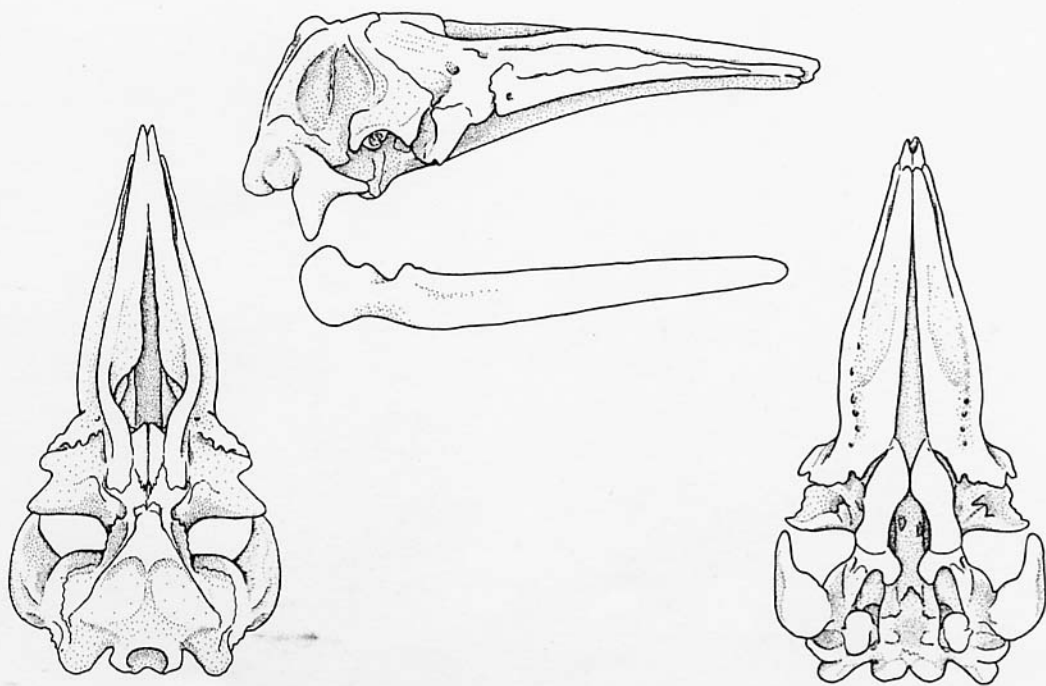


Figure 114. Skull of an eschrichtiid (*Eschrichtius*), x 1/20.

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4. **throat with two (occasionally three or four) longitudinal grooves in skin.**
5. **baleen plates short, narrow.**
6. rostrum relatively narrow, slightly arched (Fig. 114).
7. **nasal large.**
8. nasal and premaxilla extending posteriorly beyond level of anterior margin of supraorbital process of frontal (Fig. 113).
9. **frontal broadly exposed at crest of skull** (Fig. 114).
10. maxilla with elongate posterior process (Fig. 114).
11. anterior margin of parietal behind posterior margins of premaxilla, maxilla, and nasal (Fig. 114).
12. **supraoccipital not extending anteriorly beyond zygomatic process of squamosal** (Fig. 114).

Dental formula: no teeth.

Compare with: Balaenopteridae, Balaenidae.

Genus:

Eschrichtius (1) - *E. robustus* is the gray whale.

Remark: The life history of the gray whale was described by Rice and Wolman (1971).

Family BALAENOPTERIDAE (Rorquals)

Balaenopterids are readily distinguished externally from balaenids (p.241) by the long slender body, relatively small head, and numerous throat grooves. From eschrichtiids (p.243) they differ most obviously by the presence of a dorsal fin. There are also several cranial differences (see below).

In summer rorquals inhabit high latitudes of both hemispheres where they consume swarms of planktonic copepod and euphausiid crustaceans and small fish. They capture plankton either by skimming them from the water surface or by gulping them in large masses. During this feeding period these whales store up large amounts of blubber. This food store sustains them during the winter breeding period when adults are not known to feed.

Winter is spent at lower latitudes, but since this period is out of phase in northern and southern hemispheres the two stocks rarely, if ever, mix.

Small species of balaenopterids breed annually; the large species breed in alternate years. Each female gives birth to a single calf.

Because of commercial exploitation by whalers, some species of rorquals (e.g., blue whales, humpbacks) are exceedingly rare. Others (e.g., fin whales) have also declined in numbers. The numbers of blue whales may be so low that their perpetuation is in jeopardy.

Two genera, 6 species; all oceans.

Recognition Characters:

- rows of baleen continuous anteriorly (separated at anterior end of mouth in other mysticetes).

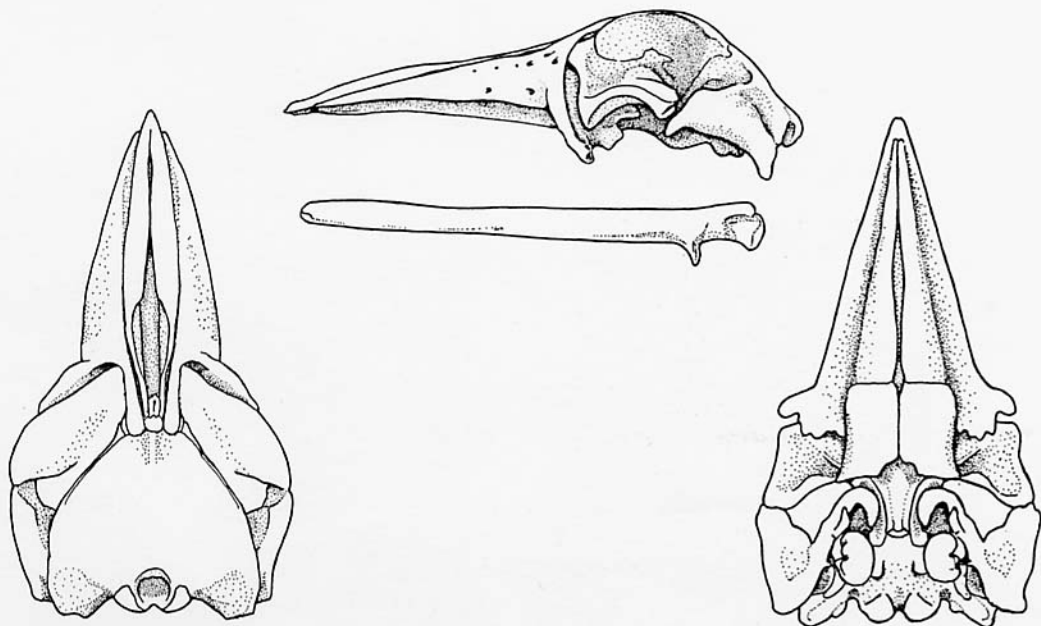


Figure 115. Skull of a balaenopterid (*Balaenoptera*, x 1/18).

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- **lower jaw conspicuously bowed outward** (\pm straight in other mysticetes).
 1. body slender (7-31 m).
 2. **color gray or black above, with varying amounts of white below.**
 3. dorsal fin present, sickle-shaped (*Balaenoptera*) or small (*Megaptera*).
 4. **numerous longitudinal grooves in skin of throat.**
 5. **baleen plates short, broad.**
 6. **rostrum relatively broad and flat** (Fig. 115).
 7. nasal small.
 8. nasal and premaxilla extending posteriorly beyond level of anterior margin of supraorbital process of frontal (Fig. 115).
 9. frontals scarcely or not at all visible at crest of skull (Fig. 115).
 10. maxilla with elongate posterior process (Fig. 115).

11. **parietal extending anteriorly beyond posterior margins of premaxilla, maxilla, and nasal** (Fig. 115).
12. supraoccipital extending anteriorly beyond zygomatic process of squamosal (Fig. 115).

Dental formula: no teeth.

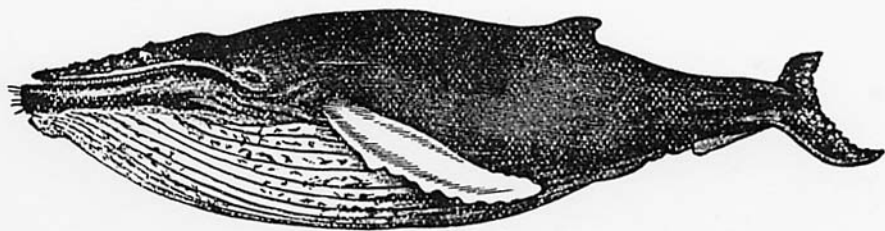
Compare with: Balaenidae, Eschrichtiidae.

Genera:

Balaenoptera (5) - Familiar examples are the fin whale (*B. physalis*), sei whale (*B. borealis*), and blue whale (*B. musculus*).

Megaptera (1) - *M. novaeangliae* is the humpback whale.

Remark: Small (1971) treated the natural history of blue whales and provided a review of the history of whaling.



Humpback whale.