



FAUNA *of* AUSTRALIA

51. PHOCOENIDAE

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DEFINITION AND GENERAL DESCRIPTION

The Phocoenidae, or true porpoises, is a group of small toothed whales (order Cetacea, suborder Odontoceti). A recent review of this family considers its evolution, taxonomy and distribution (Barnes 1985). Currently, six extant species are recognised, but only two are likely to frequent Australian waters.

Characteristics of the Phocoenidae are: more than five cervical vertebrae fused; more than 15 teeth in each row of the upper jaw; body length less than 2.45 m and the absence of light-coloured, anchor-shaped patches on the ventral skin between the flippers (Nishiwaki 1972).

The family group name for Phocoenidae is attributable to Gray (1825), who first proposed Phocaenina as a subdivision of the family Delphinidae. Barnes (1985) briefly discusses the name and its derivation. The first use of the name Phocoenidae is attributed to Bravard (1885) (see Rice, 1984).

The only published records for members of this family in Australian waters are for the Spectacled Porpoise (*Australophocaena australis*). An incomplete skull of unknown sex of a subadult animal, collected at Macquarie Island, added to the suggestion that the species may have a circumpolar distribution in subantarctic latitudes (Fordyce, Mattlin & Dixon 1984). The skull of a second adult (sex unknown), slightly damaged in the palatine-otic regions, and lacking teeth, mandible and zygomatic bones (jugals) was collected on Heard Island. [In February and March 1997, single juveniles stranded in south-eastern Tasmania and South Australia, respectively, confirming that the species ranges into southern Australian waters occasionally (K. Evans & C. Kemper, manuscript in review; note also that Rice (1998) placed this species in *Phocaena*, based on molecular studies; Ed.]

The only other member of the Phocoenidae likely to be seen in Australian waters is the Finless Porpoise (*Neophocaena phocaenoides*), which probably would be confined to inshore northern waters.

MORPHOLOGY AND PHYSIOLOGY

Phocoenids have many morphological and physiological characters that are common to all Cetaceans (see Slijper 1962; Delphinidae, see Chapter 50) Only those characters that are peculiar to the Phocoenidae are mentioned.

External Characteristics

Phocoenids are small Cetaceans. Adult Finless Porpoises attain approximately 1.5 m, and Spectacled Porpoise, 1.8 m in length. There is no distinct beak, the head is gently curved from the tip of the snout to the blowhole and the lengths of the upper and lower jaws are about equal (Fig. 51.1). No grooves are present in the skin of the throat. A notch is present at the centre of the caudal edge of the fluke. The Finless Porpoise has no dorsal fin, the only member of the family to show this character.

Skeletal System

All living and fossil phocoenids share a unique suite of derived cranial characters. These are described fully in Barnes (1971, 1984) and Kasuya (1973).

The teeth are small, short and compressed and appear spatulate when viewed from the side. There are seven cervical, 13 to 18 thoracic, 11 to 27 lumbar and 28 to 49 caudal vertebrae.

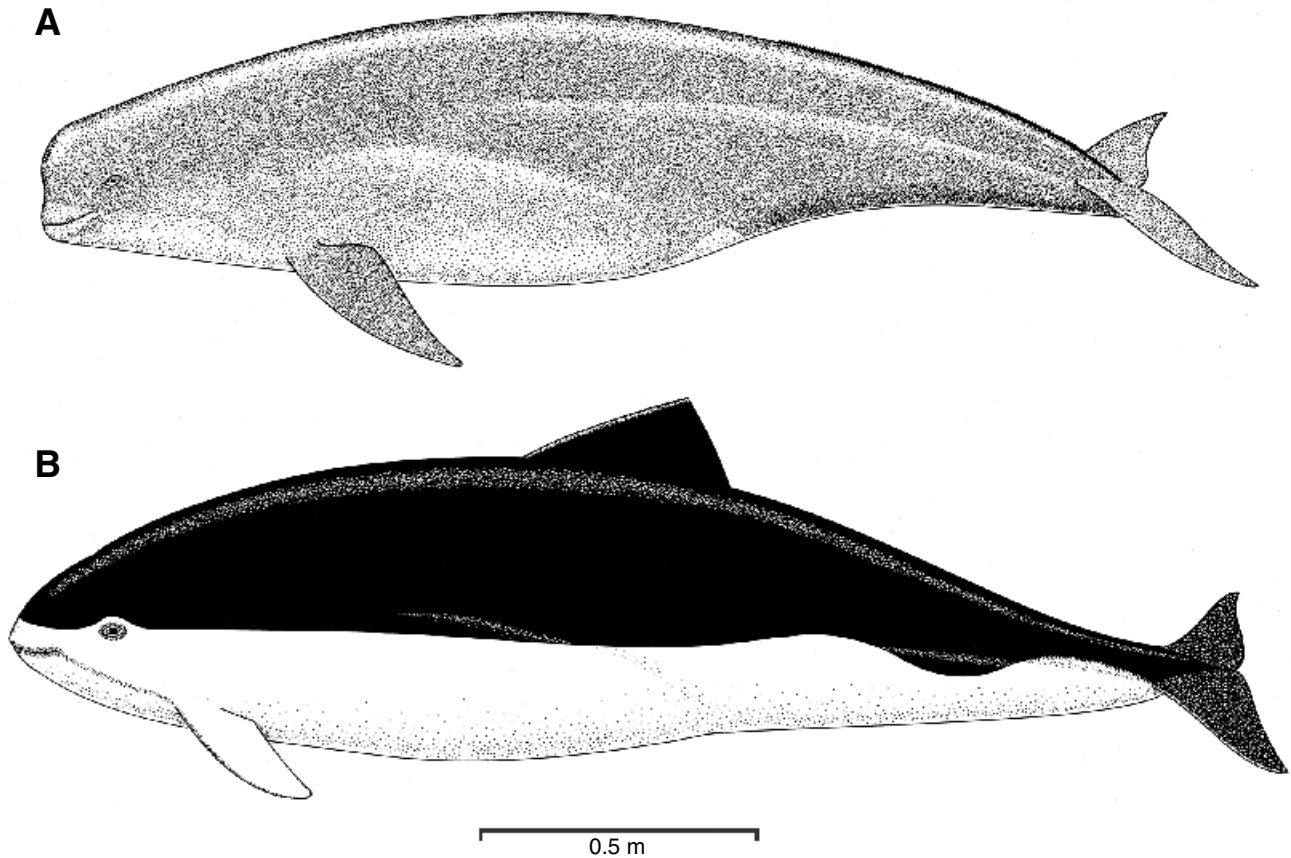


Figure 51.1 Appearance of the two phocoenid species likely to be seen in Australian waters: **A**, Finless Porpoise, *Neophocaena phocaenoides*; **B**, Spectacled Porpoise, *Phocoena dioptrica*. Finless Porpoises are generally bluish grey or slate grey, although there is considerable individual variation. Some individuals are paler on the ventral surface between the base of the flippers and the anus. The Spectacled Porpoise has a distinctly demarcated black and white pigmentation pattern. (© ABRS) [G. Milledge]

Locomotion

Although locomotion is assumed to be similar to that in other small Cetacea (see Delphinidae), no direct investigations of locomotion in Phocoenidae have been reported.

Feeding and Digestive System

Nothing is known about the food of the Spectacled Porpoise and no specimens have been collected alive. They seem to feed on small squid, small sepias and shrimps; and also take small sandlance and other fishes. The Japanese population of Finless Porpoises is known to take eggs on seaweed; leaves are thereby ingested (Mitchell 1975b).

Circulatory System, Respiration and Excretion

The anatomy of the circulatory system is similar to that in the Delphinidae, but nothing has been reported on the circulatory physiology in this group. The anatomy of the respiratory system presumably is similar to that in the Delphinidae, but no physiological investigations of respiration have been conducted. Kidney morphology of the Harbour Porpoise (*Phocoena phocoena*)

has been examined in some detail (Hedges, Gaskin & Smith 1979), but the urinary system of the species of phocoenids in the Australian region has not been examined.

Reproduction, Embryology and Development

There are virtually no data on reproduction in the group. A Spectacled Porpoise foetus 484 mm long was obtained on 28 July 1912 and young Finless Porpoise appear to be born in October (Mitchell 1975b). A few data on prenatal growth of Spectacled Porpoise were reported by Møhl-Hansen (1954) and compared with that in other Cetacea (Bryden 1972).

NATURAL HISTORY

Very little is known about the natural history of the two members of this family that frequent waters close to Australia. Finless Porpoise in Japan have been observed to form groups of 50 individuals, subdivided into subgroups of five to ten, migrating along the coast within 3–4 km of the shore. Groups of Finless Porpoise have been reported to surround a school of sandlance, so that the fish could not escape (Mitchell 1975b).

BIOGEOGRAPHY AND PHYLOGENY

The Spectacled Porpoise is known only from the south-western Atlantic and south-western Pacific Oceans. It has been observed only rarely; the few specimens that have been collected were found off the south-eastern part of South America and adjacent islands and islands to the south of New Zealand (Barnes 1985). Finless Porpoises are a coastal and riverine species that have been reported from the south-western Pacific and the Indian Oceans and some estuaries and rivers around their shores (Barnes 1985). The species is recorded from the Auckland Islands, southwest Pacific and is believed to have been sighted alive near New Zealand (Fordyce *et al.* 1984).

Phocoenids have a long fossil history that extends back at least the Late Miocene (10 or 11 mybp) (Barnes 1977). Most fossils have been found in rocks in California, Mexico, Peru and Europe; none are from Australia. The Phocoenidae is divisible into two subfamilies: the Phocoenoidinae, which includes the Spectacled and Dall's (*Phocoenoides dalli*) Porpoise, and the Phocoeninae, which includes the Finless Porpoise and the other three species of *Phocoena* (Barnes 1985).

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