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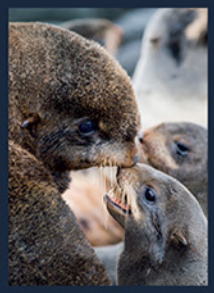

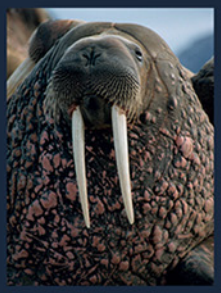


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AUSTRALIAN SNUBFIN DOLPHIN

Orcaella heinsohni

ISABEL BEASLEY AND ALEXANDER M. BROWN

The Australian snubfin dolphin (*Orcaella heinsohni*) is a coastal dolphin species in the family Delphinidae, within the genus *Orcaella*. The other species within the genus is the Irrawaddy dolphin (*O. brevirostris*). The closest relative to *Orcaella* is the killer whale *Orcinus orca*.

The Australian snubfin dolphin was first recorded in Australia in 1964 [previously considered Irrawaddy dolphin], when anthropologists found skulls of two Australian snubfin dolphins that had been eaten by Indigenous people in Arnhem Land in 1948. The name "snubfin dolphin" was first suggested in 1981, as an alternative common name. This name highlights a diagnostic external character, is appropriate to all populations, and has previously been included in general field guides. The common name, the Australian snubfin dolphin, reflects that the majority of known specimens and morphological work are based on Australian populations.

The species was named for George Heinsohn, recognizing his pioneering work on northeastern Australian odontocetes, including Australian snubfin dolphin specimens.

I. Characteristics and Taxonomy

The Australian snubfin dolphin resembles the Irrawaddy dolphin in appearance; however, there are clear and consistent differences in coloration (Fig. 1), cranial and external morphometrics, postcranial morphology and molecular data between the two species (Beasley et al., 2005).

Total length reaches 230 cm in females and 270 cm in males. Mass of three adults (2.14–2.25 m long) was recorded as 114–133 kg. The head is rounded in lateral view and lacks a pointed rostrum (Fig. 2). The body has a subtle three-tone color pattern; a distinct dark brown dorsal cape, light brown lateral field, and white abdominal field. The small variably-shaped dorsal fin (from rounded to slightly falcate) is situated in the latter half of the body (Fig. 3). The flippers are broad, paddle-like, and highly mobile.

The adult skull retains neotenic features. The number of nasal bones/depressions on each side of the skull vertex varies from none to six, compared to two nasal bones on Irrawaddy dolphin skulls. The mesethmoid plate is thin and poorly developed. The temporal fossa height is greater in the Australian snubfin dolphin than Irrawaddy dolphin. There are 11–22 teeth in each half of the upper jaw and 14–19 teeth in each lower jaw.

Genetic research along the Queensland coast found low levels of haplotype and nucleotide diversity, and marked genetic differentiation between snubfin dolphin populations from North and Central Queensland (c. 350 km apart). Similarly, analysis of nuclear and mitochondrial DNA (mtDNA) from Western Australia found significant genetic differentiation between Cygnet and Roebuck Bays (c. 230 km apart). The estimated proportion of migrants was low, and preliminary evidence indicated low effective population sizes. A hybrid, confirmed by molecular analyses as originating from a snubfin mother and Australian humpback dolphin (*Sousa* sahulensis) father, was documented at Cygnet Bay (Brown et al., 2014).

Orcaella samples from the Kikori Delta of southern Papua New Guinea were compared to other *Orcaella* samples from Australia and Asia, using mtDNA. Phylogenetic reconstruction showed that the Papua New Guinea samples clustered with Australian samples, confirming that the Australian snubfin dolphin also occurs in southern Papua New Guinea waters.

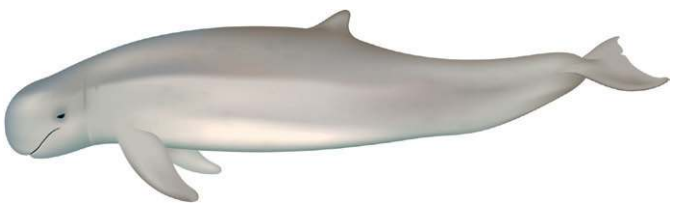

Figure 1 *Australian snubfin dolphin*, Orcaella heinsohni *(Illustration by Uko Gorter).*

Figure 2 *A snubfin dolphin rises from the water in a social group in Roebuck Bay, Western Australia, illustrating the rounded head and lack of rostrum (Photo by A. Brown).*

Figure 3 *A snubfin dolphin surfaces in Cleveland Bay, north Queensland. The bulbous head is commonly sighted first, followed by the small, rounded dorsal fin which is positioned three-quarters back on the body (Photo by I. Beasley).*

II. Distribution and Abundance

The Australian snubfin dolphin occurs throughout northern Australia and the Kikori Delta of southern Papua New Guinea (Fig. 4). In Australia, the species' primary range stretches from Roebuck Bay, Western Australia, northeast through the Northern Territory and south along the Queensland coast to the Fitzroy River region, Central Queensland. Extralimital records extend south as far as Brisbane, Queensland, and the species is occasionally recorded south of Roebuck Bay to the North West Cape in Western

A

Australia. In Papua New Guinea, the species in only known from the Kikori Delta region, southern Papua New Guinea.

The Australian snubfin dolphin occurs over the Sahul Shelf of Australia/Papua New Guinea, whereas the Irrawaddy dolphin occurs over the Sunda Shelf of South and Southeast Asia. These shelves are separated by deep oceanic waters that remained separate even during periods of lowered sea levels in the Pleistocene Ice Ages.

There are no national abundance estimates for Australian snubfin dolphins in Australia or Papua New Guinea. As of 2010, only three abundance estimates were available: 1000 animals along the Western Gulf of Carpentaria, Northern Territory, 64–76 individuals in Cleveland Bay, North Queensland and 71–80 individuals from the Keppel Bay region, Central Queensland.

More recent studies have estimated 136–222 individuals in Port Essington, and 19–70 individuals in the Darwin region (Northern Territory); 133 individuals in Roebuck Bay and 48–54 individuals in Cygnet Bay (Western Australia); and, 42–54 individuals in Cleveland Bay (Queensland). Available information suggests that Australian snubfin dolphins are typically found in small local populations of 200 individuals or less, with evidence of high site fidelity and a lack of movement between sites (Parra et al., 2006; Cagnazzi et al., 2013; Brown et al., 2016).

III. Ecology

Sighting records indicate that Australian snubfin dolphins occur mainly in shallow (<20 m deep), coastal habitats, with the highest frequency of sightings adjacent to river and tidal creek mouths and in sheltered, mangrove-lined bays. They have been reported utilizing channel habitats, including dredged channels in some locations.

Diet data are limited, but the species has been described as an opportunistic generalist feeder, preying upon bottom-dwelling and pelagic fish and cephalopods associated with coastal and estuarine waters (Parra and Jedensjö, 2014). Australian snubfin dolphins, along with Irrawaddy dolphins, are occasionally observed spitting jets of water into the air. While this behavior has not been systematically investigated, it is most commonly associated with feeding behavior and has been observed to manipulate the movement of small fish. (Fig. 5).

Shark bite scars, indicative of failed predation attempts, have been observed on Australian snubfin dolphins throughout their range. Studies in Western Australia suggest that shark predation risk represents an important ecological pressure.

Interactions between Australian snubfin dolphins and Australian humpback dolphins occur occasionally, with both aggressive/sexual (humpbacks dominating) and amicable foraging/traveling behavior observed.

IV. Behavior and Physiology

A study of association patterns among individuals in Cleveland Bay, Queensland, revealed a fission-fusion grouping pattern with numerous strong associations, including some of which were long-lasting. A sex-specific study in Cygnet Bay (Western Australia) revealed that male snubfin dolphins generally formed stronger associations and were far more gregarious than females.

Vocalizations of free-ranging snubfin dolphins in Queensland waters consisted of a varied repertoire of broadband clicks, pulsed sounds (creak, buzz, and squeaks) and whistles (Berg-Soto et al., 2014).

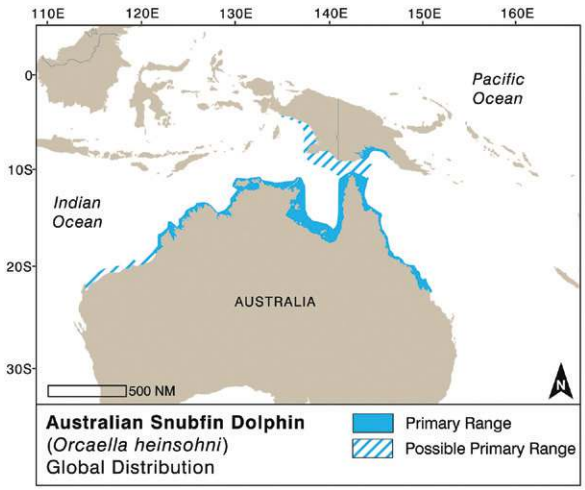

Figure 4 *Australian snubfin dolphin distribution. Adapted by Nina Lisowski from Jefferson, T.A., Webber, M.A. and Pitman, R.L. (2015). "Marine Mammals of the World: A Comprehensive Guide to Their Identification," 2nd ed. Elsevier, San Diego.*

Figure 5 *A series of three images illustrating a snubfin dolphin in Roebuck Bay, Western Australia, spitting a jet of water across the surface, apparently causing a small fish (family: Clupeidae) to leap from the water towards the dolphin (Photo by F. Smith).*

V. Life History

Little is known about the life history of the Australian snubfin dolphin. Age was determined for 18 snubfin dolphins from Townsville waters, where it was estimated that they may live for at least 30 years. Gestation length has been estimated as 11 months based on known rates of other similar species.

There is no information on age at sexual maturity of the Australian snubfin dolphin. However, based on the Irrawaddy dolphin, age of first reproduction has been estimated as 9 years and the oldest age of a reproducing female as 28 years, resulting in an estimated generation length of 15.6 years. Reproductive seasonality of the Australian snubfin dolphin is unknown.

VI. Interactions With Humans

The Australian snubfin dolphin is listed as "Migratory" by the Australian Environment Protection and Biodiversity Conservation Act 1999, "Near Threatened" by the IUCN Red List of Threatened Species, and is listed on "Appendix I" by the Convention on International Trade in Endangered Species.

Previously, the major known threat to the species in Australia was accidental capture in nets used for bather protection by the Queensland Shark Control Program. A gradual gear change from nets to baited hook drum-lines appears to have reduced mortalities. Alternatively, local extirpation may have occurred from the high levels of historical bycatch in these nets.

Currently, near-shore and commercial fisheries are a threat in both northern Australia and southern Papua New Guinea. Large-mesh gill-nets are set in creeks, rivers, estuaries and headlands, which are considered some of the preferred habitats of the Australian snubfin dolphin. The historical and current magnitude of bycatch in fisheries remains unknown; however, recent studies in Papua New Guinea have confirmed alarming levels of incidental mortality in subsistence fisheries.

Habitat loss and degradation caused by increased development and human population growth in coastal areas is a concern throughout the species' range. Suggested effects include reduced prey availability, increased industrial and urban pollution of coastal sites, increased disturbance from underwater noise, and potential collision from increased vessel traffic. Elevated levels of anthropogenic contaminants have been observed in the tissue of snubfin dolphins in central Queensland (Cagnazzi et al., 2013). A lack of data on population sizes, trends or habitat use precludes adequate consideration of the Australian snubfin data (and other coastal species) within environmental impact assessments (Allen et al., 2012). Similarly, a lack of empirical studies on the impacts of potential threats, particularly a lack of baseline data prior to threatening activities taking place, hinders an understanding of the effects of anthropogenic impacts on small, localized inshore dolphin populations.

No direct catch for Australian snubfin dolphins is known, although there are reports that the species was historically hunted by some Indigenous communities in Australia. Two snubfin dolphins were kept in captivity in Cairns in the late 1960s. These dolphins were collected north of Cairns in 1969 and are now deceased. Live capture of cetaceans is no longer permitted under Australian law, and not permitted in Papua New Guinea.

More research is needed throughout the range of the Australian snubfin dolphin in northern Australia and southern Papua New Guinea to understand population status and threats, and develop effective management priorities and strategies to contribute to conservation of the species.

See Also the Following Articles

Irrawaddy Dolphin ■ Killer Whale

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