Morphology of common dolphins (*Delphinus* spp.) photographed off Angola

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Introduction

Common dolphins (*Delphinus* spp) exhibit considerable geographic variation in morphology. Taxonomic and genetic studies have distinguished two species to date, the short-beaked *D. delphis* and the long-beaked *D. capensis* common dolphin, (Heyning and Perrin 1994; Rosel et al. 1994). The cranial characteristics of limited stranded animals suggest that both *D. delphis* and *D. capensis* occur sympatrically off Gabon and Angola in West Africa (Van Waerebeek, 1997).

This poster examines photographs taken of *Delphinus* dolphins off Angola, with the aim of determining whether the animals bear sufficient external resemblance to be clearly assigned to *D. delphis* or *D. capensis*.

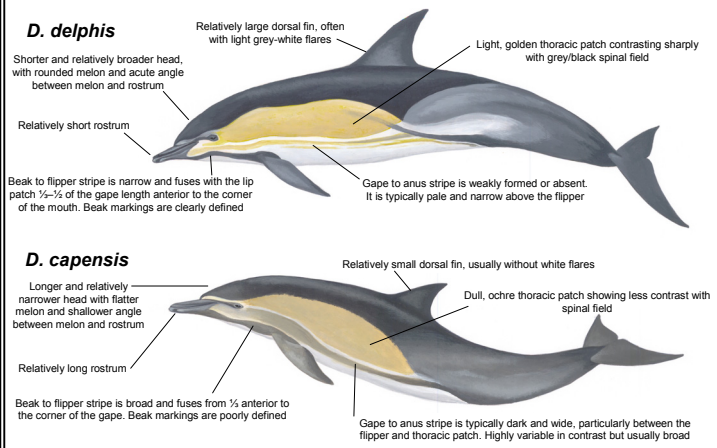
Methods

A total of 5405.1 hr of dedicated marine mammal effort data were collected during three geophysical seismic surveys off Angola between August 2004 and July 2007. A single observer scanned 360º around the vessel with the naked eye and 8–10x binoculars.

Effort logs (comprising position, time, water depth and environmental data) and cetacean sighting data (comprising species, group size, behaviour, position and water depth) were completed throughout. Incidental cetacean sightings were reported from seismic survey, benthic research and sports fishing vessels. Animals were primarily photographed in the field using a Canon SLR camera and a 100–400mm Canon zoom lens

Delphinus delphis and *D. capensis*

In the North-east Pacific *D. capensis* has larger body size, skull size and rostrum length than *D. delphis*, and the two species exhibit distinctive colour pattern characteristics that facilitate the at-sea identification of adult animals (Heyning and Perrin, 1994). The primary features used to distinguish between the two species are illustrated below.



In addition to morphological differences, the two species vary ecologically, with *D. capensis* having greater abundance in warmer and more coastal (<185 km of the coast) waters than the more cosmopolitan distributed *D. delphis* (Heyning and Perrin, 1994).

Ecology of Angolan *Delphinus*

A total of 28 *Delphinus* sightings (1,889 animals) were recorded during the dedicated survey work, with a further 19 incidental records (2,165 animals) reported. *Delphinus* sightings were distributed across shelf, shelf-edge and deep-water areas (Figure 1), with the apparent deep-water bias being a result of the distribution of survey effort. Group size varied from 1 to 500 animals (Figure 2).

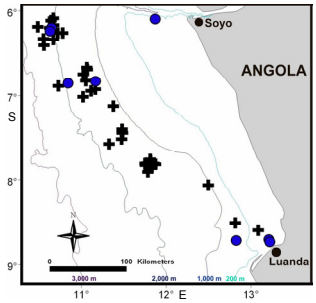


Figure 1. Location of *Delphinus* sightings off Angola, with the location of photographic encounters shown as blue circles.

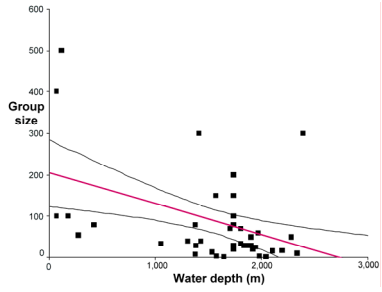
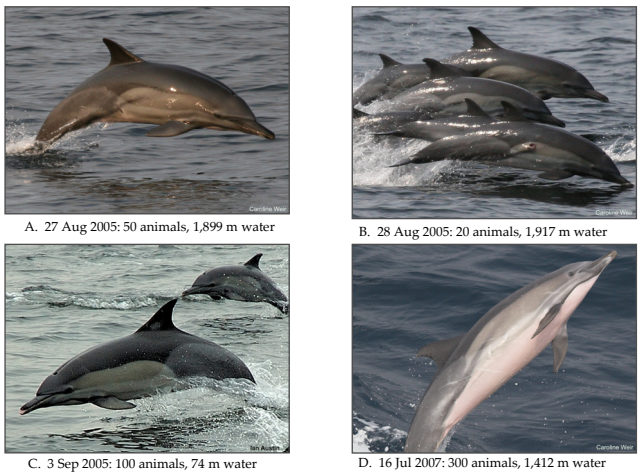


Figure 2. Correlation between group size and water depth showing the line of best fit and 95% confidence intervals. Group size decreased significantly (Spearman Rank r(s)= -0.41, p=0.005), with increasing water depth

Morphology of *Delphinus* in Angola

Eight *Delphinus* groups were photographed, comprising three groups from shelf waters (74–180 m), one from the upper shelf edge (470 m) and four from the lower shelf edge (1,412–1,917 m). All sightings occurred <200 km of the coast, and were therefore within the range of sympatric *D. capensis* and *D. delphis* in the North-east Pacific Ocean. Although exhibiting some individual variation, the external appearance of most adult Angolan *Delphinus* has several consistent features (Figure 3).



A. 27 Aug 2005: 50 animals, 1,899 m water

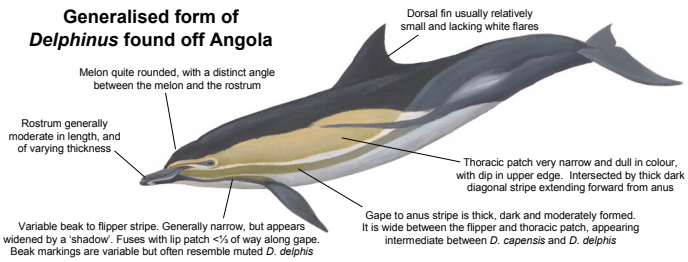
B. 28 Aug 2005: 20 animals, 1,917 m water

C. 3 Sep 2005: 100 animals, 74 m water

D. 16 Jul 2007: 300 animals, 1,412 m water

Figure 3. Examples of morphology in *Delphinus* photographed off Angola

A generalised adult Angolan form of *Delphinus* is illustrated below, and particular features are compared with those described previously for *D. delphis* and *D. capensis*.



The key features of most adult *Delphinus* off Angola include:

- A narrow thoracic patch of subdued colouration, intersected by a dark diagonal stripe extending forward from the anus
- A moderately-formed thick, grey and conspicuous gape to anus stripe
- A rostrum that is shorter and thicker than typically seen in *D. capensis*, but is longer and more slender than typical *D. delphis*, and a fairly rounded melon
- A beak to flipper stripe that narrows only moderately anterior to the eye, and fuses with the lip patch <⅓ of the way along the gape
- A slender overall body shape, and a relatively small dorsal fin that lacks pale central flares

However , some Angolan *Delphinus* vary from this generalised form, e.g. Figure 3C

Conclusions

- The morphology of *Delphinus* off Angola is not fully consistent with either *D. delphis* or *D. capensis*
- Of the two species, Angolan *Delphinus* appear to show most affinity with *D. capensis* but with a shorter rostrum, narrow beak to flipper stripe, and a distinct, dark intersecting thoracic stripe
- The taxonomic status of Angolan *Delphinus* remains unclear. These animals could represent an intermediate (ecologically and/or genetically) form of *Delphinus*, a single continuously variable *Delphinus* species (e.g. Bell et al., 2002), or perhaps even a distinct subspecies as suggested for *D. tropicalis* in the Indian Ocean (Jefferson and Van Waerebeek, 2002)
- More data, particularly genetic samples, sex data and skull measurements are required to better clarify the status of *Delphinus* in Angolan waters for management and conservation purposes
- Although Heyning and Perrin (1994) found the colour pattern of North-east Pacific *D. capensis* and *D. delphis* was 'markedly distinct' and sufficient to permit at-sea species identification, this is not the case off Angola. Until genetic samples and skull measurements become available, it is recommended that *Delphinus* dolphins sighted off Angola are recorded simply as '*Delphinus* spp'

Literature cited: **Bell, C.H., Kemper, C.M. and Conran, J.G. 2002.** Common dolphins *Delphinus delphis* in southern Australia: a morphometric study. Australian Mammalogy, 24: 1-10. **Heyning, J.E., and Perrin, W.F. 1994.** Evidence for two species of common dolphins (genus *Delphinus*) from the eastern North Pacific. Contributions in Science, 442: 1-35. **Jefferson T.A. and Van Waerebeek K. 2002.** The taxonomic status of the nominal dolphin species *Delphinus tropicalis* Van Bree, 1971. Marine Mammal Science 18:787-818. **Rosel, P.E., Dizon, A.E. and Heyning, J.E. 1994.** Genetic analysis of sympatric morphotypes of common dolphins (genus *Delphinus*). Marine Biology, 119: 159-167. **Van Waerebeek, K. 1997.** Long-beaked and short-beaked common dolphins sympatric off central-West Africa. Paper SC/49/SM46 presented to the IWC Scientific Committee, October 1997 (unpublished). 4pp.

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Further information: More information on this and related Angola cetacean research can be obtained at *www.ketosecology.co.uk* An online PDF-version of this poster is available at: *www.ketosecology.co.uk/SMM2007.htm*