

Short communication

Antarctic orca in New Zealand waters?

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Abstract I report on a group of orca (*Orcinus orca* (Linnaeus, 1758)) near the Bay of Islands, New Zealand, which were a lighter coloration than orca usually seen in these waters. Differences in pigmentation included a light grey caudal peduncle area and a dorsal cape, which has previously only been described for Antarctic orca. The size and shape of the eye patches were not consistent with orca photo-identified in New Zealand. I suggest that this group of orca, although observed in New Zealand waters, were of Antarctic origin.

Keywords *Orcinus orca*; New Zealand; Antarctic; pigmentation; dorsal cape; eye patch; migration; photo-identification

INTRODUCTION

Orca (*Orcinus orca* (Linnaeus, 1758)) are easily distinguished by their striking black and white colour pattern (Heyning & Dahlheim 1988). They also have a variable grey or whitish area posterior to the dorsal fin (Baird & Stacey 1988) which is commonly referred to as the saddle patch. Evans et al. (1982) refer to the differences in geographic variation of pigmentation patterns of orca from various locations around the world, including the Antarctic. Documentation regarding the pigmentation of Antarctic orca in most instances refers to a lighter over all colour

with a "cape" over the dorsal area (e.g., Evans & Yablokov 1978; Thomas et al. 1981; Evans et al. 1982). As part of an on-going study (since December 1992) of New Zealand orca, 117 individuals have been catalogued using photo-identification methods after Bigg (1982). Most orca in these waters were noted as dark varieties (with the exception of one albino).

METHODS

On the 1 May 1997, I photographed a group of eight orca near the Bay of Islands (35°09'S 174°08'E), North Island, New Zealand. Photographs were taken using a Nikon F90 camera with a 80-200 lens and Kodak Ektapress colour print film. The group composition was established after definitions used by Bigg (1982). Using a 5.8 m inflatable boat, the encounter was maintained for just over 1 h.

RESULTS

Group details

Eight orca were sighted, comprising one adult male, one subadult male, one calf and five females or "unknowns". The animals had arrived from the north, and were travelling south at c. 5 knots in an erratic pattern and were difficult to approach. Consequently only three of the eight orca were photographed clearly.

General colour

The typical coloration for New Zealand orca, black over the dorsal and caudal peduncle area, with a grey saddle area behind the dorsal fin, is represented in Fig. 1. However, the orca photographed on the 1 May 1997 were closer to "slate grey" than black (Fig. 2). All individuals in the group had a very light grey saddle patch, as well as a lighter grey area extending from the posterior edge of the grey saddle patch down the caudal peduncle towards the tail flukes (Fig. 2).

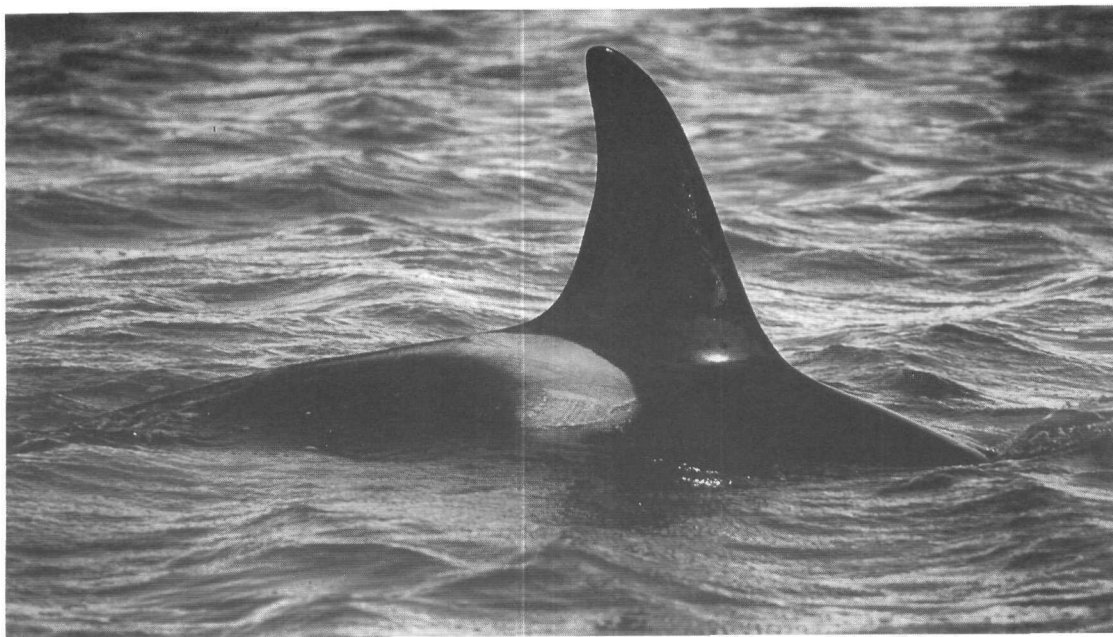


Fig. 1 “Typical” coloration of a New Zealand orca (*Orcinus orca*), where the body and caudal peduncle are black, and the saddle patch is grey.



Fig. 2 One of the orca (*Orcinus orca*) photographed on 1 May 1997, with the colour closer to “slate grey” than black. All individuals in the group had a very light grey saddle patch, as well as a lighter grey area extending from the posterior edge of the grey saddle patch down the caudal peduncle towards the tail flukes.

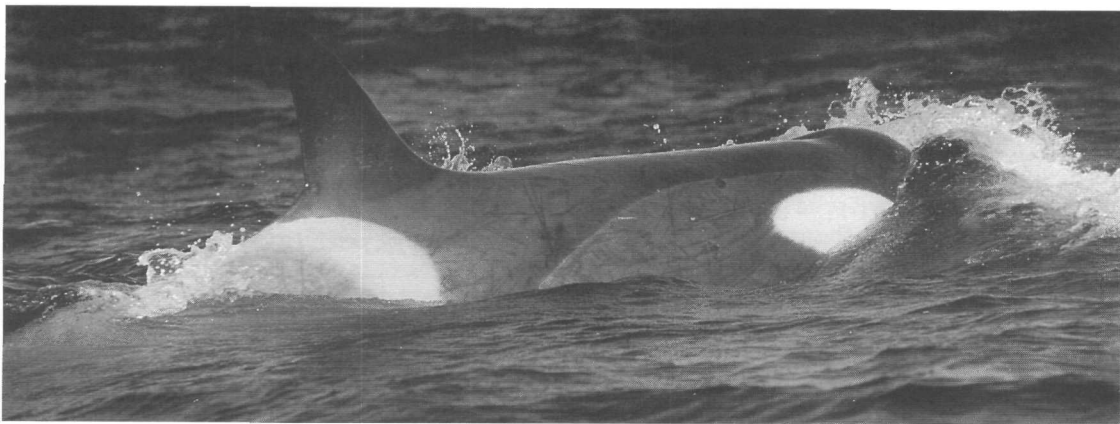


Fig. 3 Dorsal cape extending from the anterior portion of the eye patch over the top of the eye patch and about midway between the eye patch and dorsal fin dipping sharply to meet with the saddle patch. The area above this demarcation line was the only dark area on any of the orca (*Orcinus orca*) with the melon appearing the darkest. Below the dorsal cape the pigmentation was dramatically lighter, although slightly darker than the pigmentation on the caudal peduncle.

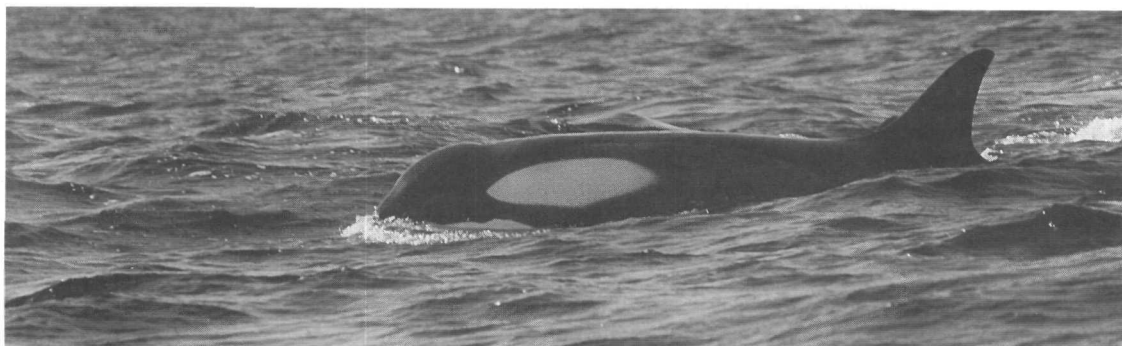


Fig. 4 The eye patch was a similar shape on all the orca (*Orcinus orca*) present, being a rounded or “smooth” shape at the front and was also large compared to orca previously recorded in New Zealand waters.



Fig. 5 Showing one of the oval scars attributed to a cookie cutter shark bite and the demarcation line of the dorsal cape above the eye patch.

Dorsal cape

All eight orca also had a distinctive and clearly visible "dorsal cape" (Fig. 3), or a "bipartite cape" (Jehl et al. 1980). In all instances the dorsal cape extended from the anterior portion of the eye patch over the top of the eye patch and about midway between the eye patch and dorsal fin dipped sharply to meet with the saddle patch (Fig. 3). The area above this demarcation line was the only dark area on any of the animals with the melon area appearing the darkest. Below the dorsal cape the pigmentation was dramatically lighter, although slightly darker than the pigmentation on the caudal peduncle.

Eye patch

The post ocular white pigmentation, commonly referred to as the eye patch, was a similar shape on the eight orca present. All animals had a rounded or "smooth" shape to the front of the eye patch (Fig. 4), compared to a "hook" or a "hook and bump" shape which are the most common types of patches recorded in New Zealand (Visser & Mäkeläinen 2000 in press). The size of the eye patch was also considerably larger (Fig. 4) compared to orca previously recorded in New Zealand waters.

Both Jehl (1980) and Evans et al. (1978) make comments about orca in Antarctic waters having eye patches that are "oriental" in orientation, where an imaginary line drawn through the long axis of the eye patch intersects the outline of the body through the dorsal fin (Evans & Yablokov 1978). Evans et al. (1978) also state that other types of eye patches are found in the Antarctic, although not with the frequency of the oriental orientation. The orientation of the eye patch seen on the eight orca reported here was "parallel", where an imaginary line drawn through the long axis of the eye patch intersects the outline of the body at the posterior end of the tail stock, or under the tail and is consistent with eye patches found on New Zealand orca (Visser & Mäkeläinen 2000 in press).

General remarks

Each animal had numerous tooth rake marks which could be attributed to interactions from conspecifics (Scheffer 1969; Visser 1998). Most of the individuals also had small oval marks that appear to be cookie cutter shark (*Isistius brasiliensis*) bites (Fig. 5), similar to those reported in Gasparini (1996). The females in the group ($n = 5$) were estimated to be larger and more robust than most adult female orca seen in the New Zealand population.

DISCUSSION

Differences in shape and position of eye patches support the conclusion that regional groups of orcas exist (Perrin 1982). Pigmentation patterns such as the saddle patch and eye patch may provide clues on the genetic isolation of orca population (Baird & Stacey 1988). Antarctic orca have been described as having a large eye patch (Evans & Yablokov 1978). Additionally, only orca found in the Antarctic have been reported with dorsal capes similar to the individuals described above (Jehl et al. 1980; Evans et al. 1982). Differences in pigmentation patterns, as indicators of populations of orca, supports the hypothesis that the orca reported here may have been from the Antarctic.

Although light, or white coloured cetaceans are not unusual and have been reported for orca (Scammon 1874; Carl 1960; Hain & Leatherwood 1982) no orca seen (with the exception of one "albino" report which has not been verified) or photographed in New Zealand are as light coloured as those reported here. In over 5000 photographs of New Zealand orca, collected both opportunistically and historically (from as early as 1915), no images show either a dorsal cape or pale pigmentation. These images were collected over all months of year, from the north of the North Island to the south of the South Island and further south to the Snares Island group.

Although orca are found throughout all oceans of the world (Heyning & Dahlheim 1988) they have not been reported migrating large distances. However they have been reported moving 124 km in 17 h (Lowry et al. 1987), 150 km in 24 h (Visser unpubl. data), and at least 2660 km over a 5-year period (Goley & Straley 1994). This paucity of information about orca migrations may be biased in that they have not been tagged like the commercially hunted whales. Ongoing research and cooperation between programs may reveal longer distance migrations in the future.

A migration pattern for Antarctic orca has been suggested before, by Mikhalev (1981) who commented orca leave the Antarctic before winter, and Kasamatsu (1995) proposed orca migrate into Antarctic waters in early January and leave in late February. However in 1955 sixty orca were sighted in August (winter) in sea ice off the Graham land Coast (Taylor 1957) and more recent information (Gill & Thiele 1997) also contradicts these migration suggestions. If the eight orca sighted near the Bay of Islands were in fact Antarctic orca, the minimum distance that they would have travelled (direct route) is 4000 km.

In conclusion, it appears that these orca would normally be classified as "Antarctic orca" based on their pigmentation patterns. The implications of orca possibly moving such distances must be considered for management purposes. Issues could include the fact that orca found in New Zealand waters may be subject to hunting pressures if they are travelling outside the New Zealand Economic Zone, where small cetaceans are no longer protected by either national or international rule. Further research into orca from the Antarctic region and comparisons with nearby populations may help to clarify the observations made here. Genetic information would certainly help to answer many of the questions posed.

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