

# First record of a leucistic sub-Antarctic fur seal

Christopher W. Jones<sup>1</sup>, Michelle M. Risi<sup>1</sup>, Alexis Osborne<sup>1</sup>, Marthán N. Bester\*<sup>2</sup>

<sup>1</sup>The RSPB Centre for Conservation Science, Royal Society for the Protection of Birds, Sandy,  
Bedfordshire SG19 2DL, UK

<sup>2</sup>Mammal Research Institute, Department of Zoology and Entomology, University of Pretoria,  
Private Bag X20, Hatfield, Pretoria 0028, South Africa

\*Corresponding author: +27(0)726015470; +27(0)124202534 (fax);

[mnbest@zoology.up.ac.za](mailto:mnbest@zoology.up.ac.za); [u02330946@up.ac.za](mailto:u02330946@up.ac.za)

## Abstract

Anomalous pelage colourations have been reported to occur in several pinniped species and can potentially be used to assess gene flow amongst conspecific populations. Aberrant pelage colour has not been documented in sub-Antarctic fur seals *Arctocephalus tropicalis* older than pups. Sub-Antarctic fur seals were inspected on two of the beaches at Gough Island, South Atlantic Ocean, in the austral summer of 2018/19. A leucistic adult male was sighted on 09 January 2019, the first recorded leucistic individual for the species. Given the apparent extreme rarity of leucism in this sub-Antarctic pinniped species, it is unlikely to contribute to assessment of gene flow amongst conspecific populations.

Key words: Gough Island, *Arctocephalus tropicalis*, hypo-pigmentation, pinniped, rare trait

## Introduction

Leucistic individuals of any species lack pigmentation in the outer integument but typically have normally coloured eyes and body extremities (Rook et al. 1998; Summers 2009). Leucism has been reported several times in Antarctic fur seals *Arctocephalus gazella* and occurs at a low rate in this species (Bonner 1968; de Bruyn et al. 2007; Acevedo et al. 2009; Hofmeyr et al. 2005, 2016; Wege et al. 2015; Peters et al. 2016; Romero and Tirira 2017). This colour polymorphism

suggests a limited contribution of gene flow towards the recovery of the heavily exploited Antarctic fur seal (Hoffman et al. 2018). Leucism has, however, never been recorded unequivocally in sub-Antarctic fur seals *A. tropicalis* (*vide* Hofmeyr and Bester 2018) before now. Although anomalous lighter lanugo coat colourations of sub-Antarctic fur seal pups occur on Marion Island, once moulted, these pups had normal pelage colouration (du Toit et al. 2019).

Sub-Antarctic fur seals are distributed in the Southern Ocean north of the Antarctic Polar Front between 10° West and 170° East where breeding populations are found on seven islands or archipelagos (Hofmeyr and Bester 2018). The northern group of the Tristan da Cunha (TdC) islands consists of Tristan da Cunha, Inaccessible and Nightingale islands. The southernmost and most isolated island in the group, Gough, lies 380 km to the southeast at 40°19' S, 9° 57' W. The overall population of sub-Antarctic fur seals at the TdC islands increased over the past 40 years (Bester et al. 2019), the population at Gough Island has possibly recovered to pre-exploitation levels (Bester et al. 2006). The Gough Island population numbers some 300,000 animals with an estimated 60,000 pups born each year, about 80% of the world population (Bester and Ryan 2007).

We report on an adult male sub-Antarctic fur seal seen with aberrant pelage colouration on Gough Island (this study) and investigate as to whether this individual is the first record of leucism for the species.

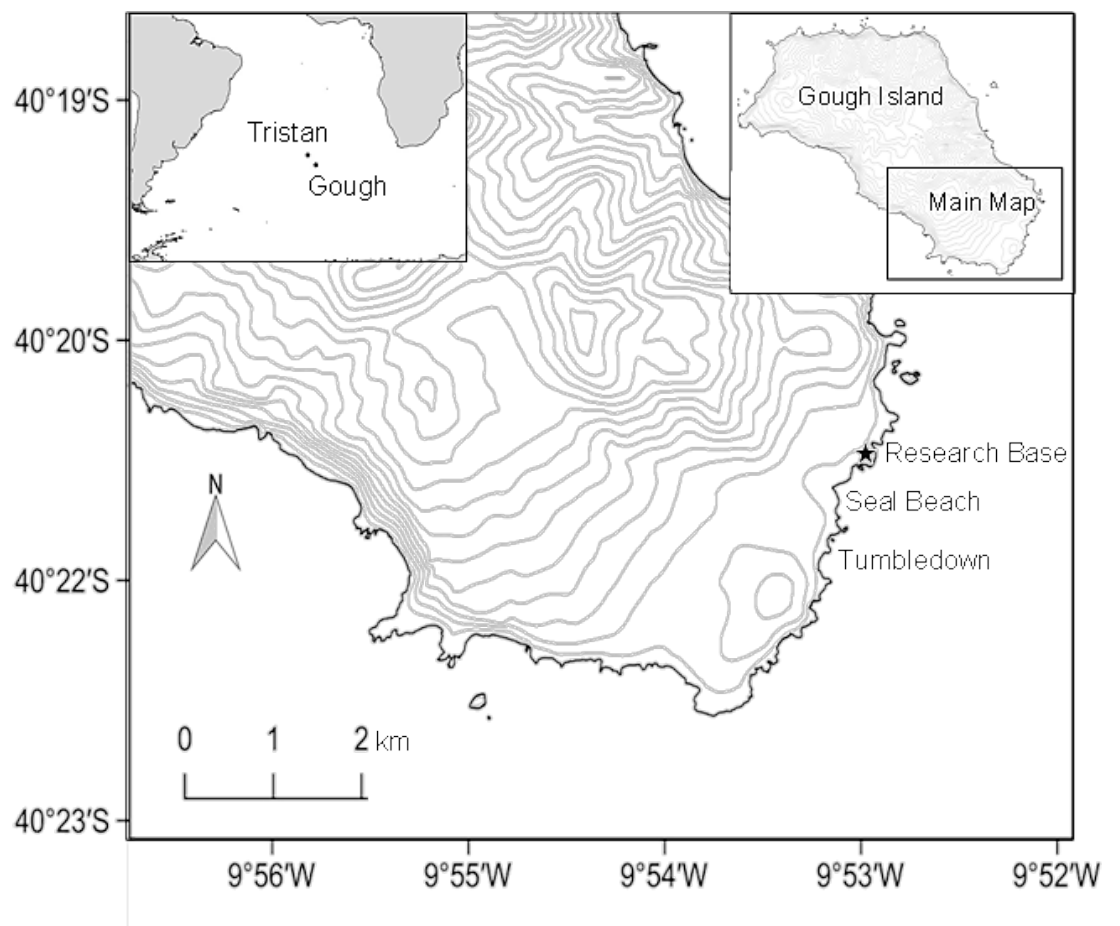
## **Methods**

### ***Study Area***

From September 2017 to March 2018, Seal Beach and Tumbledown Beach on the southeast coast of Gough Island (40°19' S, 9°57' W; Fig. 1) were regularly visited to execute particular tasks related to penguin research. During these visits seals were observed opportunistically, but no systematic surveys of seals were carried out.

## **Results and Discussion**

Although most beaches on Gough Island are inaccessible and the vast majority of fur seals go unnoticed, only one male fur seal was recorded with what can be described as uncommon pelage colouration (Fig. 2a).



**Fig. 1:** Map of Gough Island showing its position in the South Atlantic Ocean (insets), the main section detailing the location of the southeastern beaches mentioned in the text, where the sub-Antarctic fur seal with aberrant pelage colour was seen in January of 2019

Bester (1977) described the pelage colouration of the Gough Island fur seal population specifically. He found that the dorsum of adult males varies from almost black to grey with a conspicuous cream to yellow chest and throat. The latter area differs distinctly from the darker dorsum which can be strongly grizzled, and extends up on the level of the ear pinnae, around the eyes, and across the bridge of the nose. The dark colouration of the head and crest of longer hairs comes to a clearly marked point between the eyes. The light colour of the chest may reach the level of the insertion of the fore flippers in some cases. There is a brown to chocolate area around the ventral side of the insertions of the fore flippers, which may extend as a continuous broad band across the ventral side between the fore flippers. Fur on flippers varies from dark chocolate to fawn. Older males tend to have an overall brown ginger hue in the coat and the chest fur can become russet, probably due to staining on the colony. The top of the crest becomes lighter in colour and the flipper fur is buff and belly dark brown (Bester 1977).

The adult male fur seal in the present study (sex based upon large size and appearance), sighted at the nonbreeding colony (as defined in Bester 1982) of Seal Beach (Fig. 1), starkly differed from the previous descriptions of the pelage colouration in sub-Antarctic fur seals, exemplified by the colouration of a typical adult male from Gough (Fig. 2b). It also differed from a hitherto unreported adult male seen in February 1975, which had a uniformly yellow-white to grey-white chest, throat, face and dorsum, including the crest on the head, and completely white whiskers. The only darker pelage was around and on the flippers, on the head, lower back and on the rump (Fig. 2c).

The vibrissae of the muzzle of the aberrant adult male sighted on 09 January 2019 were almost all white (Fig. 2a) and the pelage, particularly on the dorsal and lateral sides of the head, neck and back up to the level of the insertion of the front flippers was creamy-yellow in colour. The rump and part of the lower back had a peppery colour, darkening towards the tail, and the fur on the flippers was a dark tan (Fig. 2a). All exposed skin (flippers, ears and nose), and the eyes, were the usual dark brown/black of the species. This colouration conforms to the leucistic state (Rook et al. 1998; Summers 2009; Romero and Tirira 2017).



**Fig. 2a** Image of the entire dorsum, including front flippers and hind flippers, of the leucistic adult male sub-Antarctic fur seal of January 2019 at Gough Island (photograph by Christopher Jones)



**Fig. 2b** Image of the entire dorsum, including front flippers and hind flippers, and muzzle, throat and chest of a typically coloured adult male sub-Antarctic fur seal at Gough Island (photograph by Christopher Jones)



**Fig. 2c** Image of the apparently old adult male sub-Antarctic fur seal with a grizzled appearance in February 1975 at Gough Island (photograph by Marthán Bester)

Although no clear crest on the head of the January 2019 male can be seen (sometimes inconspicuous in adult male sub-Antarctic fur seals, see Bester 1977), similar to the Antarctic fur seal (Condy 1978; Kerley 1983), the broad, relatively short front flippers and relatively short fleshy extensions to the hind flippers (Fig. 2a) are, by comparison to the Antarctic fur seal, diagnostic for sub-Antarctic fur seals (Kerley 1983). Also, the male's guttural challenge was typical of adult male sub-Antarctic fur seals compared to Antarctic fur seals (St. Clair Hill et al. 2001). Furthermore, although previously recorded at Gough Island as vagrants in spring, Antarctic fur seals abandon the island after October and therefore before the onset of the breeding season in late November of the resident sub-Antarctic fur seals (Bester 1987; Wilson et al. 2006; Bester et al. 2014).

We therefore conclude that the two adult male sub-Antarctic fur seals (from 1975 and 2019) in question displayed forms of hypo-pigmentation, likely a result of old age in the 1975 individual (>18 years, Bester 1987), but the 2019 individual expressed the genetic trait of leucism (Hoekstra 2006), the first for the species. Given the ongoing long-term monitoring and large numbers of sub-Antarctic fur seals inspected on Gough and Marion islands as well as at several other important breeding sites since the 1970s (Bester et al. 2011 and references therein), this aberrant pelage condition must be extremely rare in this species, hence it is unlikely to contribute to assessment of gene flow amongst conspecific populations.

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### **Compliance with ethical standards**

Conflict of interest: The authors declare that they have no conflict of interests.

Ethical approval: Field procedures were approved by the Animal Ethics Committee of the RSPB.



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