MELANISTIC RAZORBILL *ALCA TORDA* AT MACHIAS SEAL ISLAND, NEW BRUNSWICK, CANADA

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ABSTRACT

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Aberrant colouration in birds is relatively common but melanism occurs infrequently. We report an observation of a melanistic Razorbill *Alca torda* attending the nesting colony at Machias Seal Island, Bay of Fundy in 2022 and 2023. This is the third reported occurrence of a melanistic Razorbill and the first in over 100 years.

Key words: Alcidae, aberrant colouration, melanism, plumage, Razorbill

INTRODUCTION

Melanism, an increase of black or darker red/brown pigments (Bond & Diamond 2016), occurs when abnormally high levels of melanin are deposited in feathers or when melanin replaces some or all of the carotenoids in plumage (van Grouw *et al.* 2011, Guay *et al.* 2012). Aberrant plumage colouration (e.g., leucism) occurs with relative frequency in seabirds but melanism tends to occur less than other types of abnormal colouration (Gross 1965, Bond & Diamond 2016). In the family Alcidae, only a few occurrences of melanism have been documented, including in the Atlantic Puffin *Fratercula arctica*, Common Murre *Uria aalge*, Thick-billed Murre *U. lomvia*, and Razorbill *Alca torda* (Gross 1965, Pyle 2013, Bond & Diamond 2016, Schoen *et al.* 2022). For Razorbills in particular, there are only two previously documented occurrences of melanism, both from over 100 years ago (Gross 1965). The first was a specimen from Lord Walter Rothschild's collection (now held at the Natural History Museum at Tring; registration number NHMUK1987.24.283) The second was mentioned in Gross (1965) and referred to as "Schaanning (1932)"; we have been unable to find additional information on this second account.

The Razorbill is a medium-sized seabird (~700 g as adults) belonging to the family Alcidae that nests on islands around the North Atlantic Ocean (Lavers *et al.* 2020). Definitive alternate plumage in Razorbills is mostly black on the upperparts and white on the underparts (Lavers *et al.* 2020, Fig. 1). Breeding ornamentation includes white feather tips of the basic secondaries, a white loral line of alternate feathering extending from the eye to the culmen, and a white line near the base of the bill that runs vertically from the upper mandible to the lower (the latter of which is also present in basic plumage; Lavers *et al.* 2020, Fig. 1). Razorbill basic plumage includes a dark head and often (but not always) a lack of the white loral line; the white line on the bill is present in winter (Lavers *et al.* 2020). The melanistic Razorbill from Rothschild's collection shows a distinct lack of both the white loral line and the white line across the tips of the secondaries, and a dark chest with some scalloping (Fig. 2).

Machias Seal Island (MSI) is a small island located at the mouth of the Bay of Fundy in New Brunswick, Canada, and designated as a Migratory Bird Sanctuary by Environment and Climate Change Canada. A monitoring program by the Atlantic Laboratory for Avian Research (ALAR) at the University of New Brunswick has occurred annually on the island since 1995, documenting seabird responses to marine ecosystem change. The Razorbill population on MSI has been rapidly growing in recent years, from around 600 pairs in 2000 to 3500 nesting pairs in 2019 (ALAR unpubl. data).

RESULTS AND DISCUSSION

In June 2022, we observed a melanistic Razorbill attending the MSI colony, near one of our research blinds at the northern tip of the island (termed the "Goofa blind"). The bird was observed in the same location several times throughout the nesting season (i.e., May–August) and again during the 2023 nesting season. Plumage colouration did not differ between 2022 and 2023. We photographed the individual on 21 June 2023, documenting its mostly dark scalloped underparts and its lack of both a white loral line and a white line across its secondaries (Fig. 3). The colouration of this bird is virtually the same as the melanistic Razorbill from the Rothschild collection but with heavier scalloping.

During the alcid nesting season on MSI, observations were conducted at four research blinds most days of the week during three-hour periods, to record adults returning to the colony with prey to feed chicks. At the Goofa blind in 2022 and 2023, a total of 102 hours of resighting (i.e., 34 watches) and 84 hours of feeding watches (i.e., 28 watches) occurred. The melanistic Razorbill was observed during fewer than half of the watches.

Pyle (2013) suggests that, for Common Murres observed at the Farallon Islands, California, USA, abnormal dark feathering to the basic plumage may be the result of birds initiating their prebasic

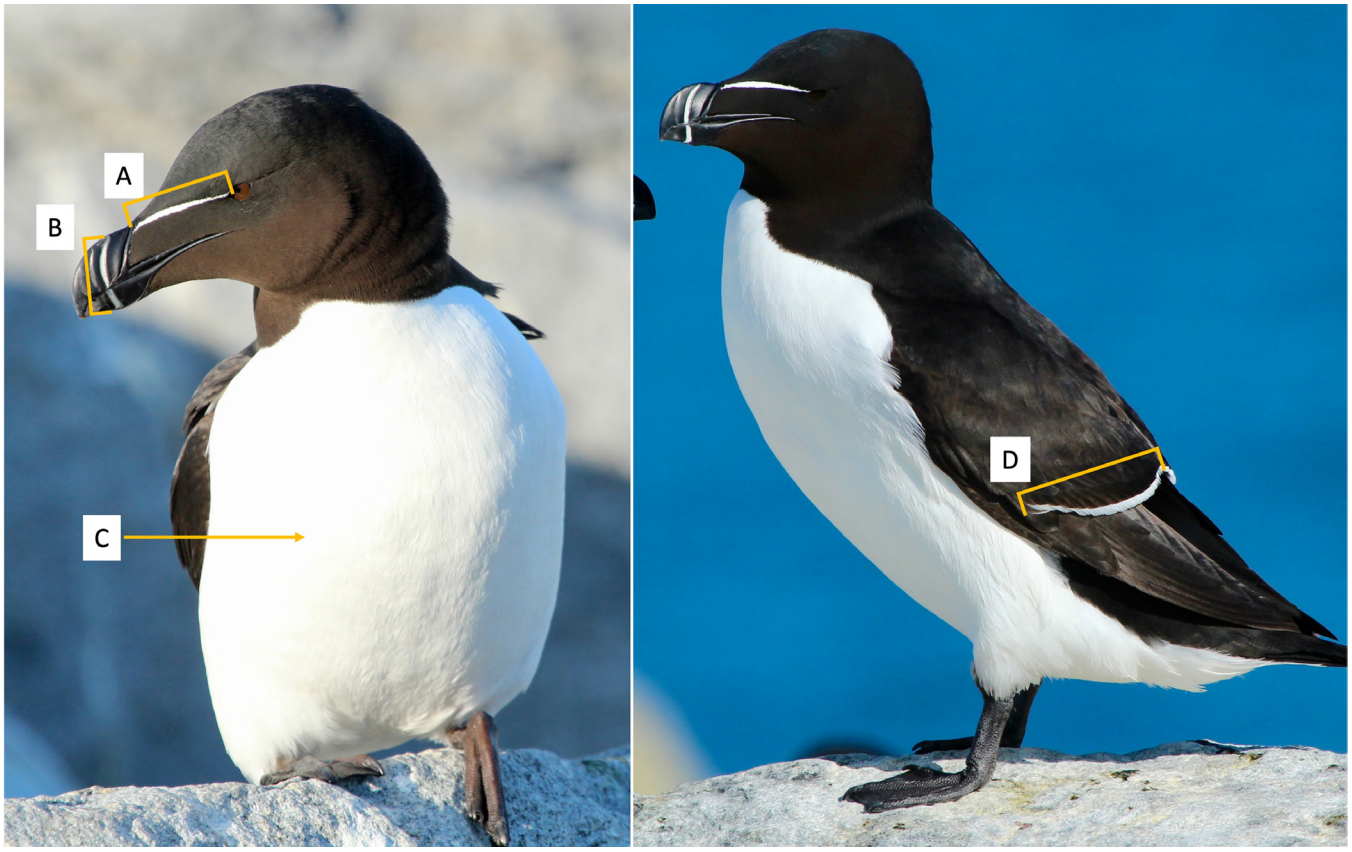

Fig. 1. Razorbill *Alca torda* definitive alternate plumage, highlighting the A) feathered white loral line, B) white bill line, C) white underpart feathering, and D) white line formed by the tips of the secondaries. Photo credit: Heather Major, Machias Seal Island, Canada, 2023

molt early, before hormone signalling has switched from dark to white (i.e., asynchrony of hormone signalling and molt cycles). The white scalloping on the chest of the Razorbill observed at MSI might signal this molt-plumage interaction instead of pure melanism. Underpart feathers on Razorbills are dark near the base (i.e., plumulaceous part) with white tips (i.e., pennaceous part). It is possible that the prebasic molt was late (relative to plumage signalling), with signalling for dark colouration switching mid-molt and leading to fully dark chest feathers. However, as with the Common Murre described by Schoen *et al.* (2022), the Razorbill at MSI was observed with similar dark plumage in two consecutive years. Like the murres, underpart plumage is white in both basic and alternate plumages, rather than the dark plumage observed on both this individual and the murre observed by Schoen et al. (2022). Further, if the dark colouration observed was due to asynchrony of hormone signalling and molt cycles, we would expect the presence of the white line across the tips of the secondaries. Signalling for alternate plumage should have included this line, but this white line is also dark. Hence, we argue that this Razorbill's dark feathering is the result of melanism.

It remains unknown why aberrant colouration occurs, but there is some evidence that fitness and survival in melanistic individuals is lower than conspecifics in typical plumage (Bond & Diamond 2016). We haven't observed this melanistic Razorbill carrying food into the colony or entering any crevice in the rocks that would serve as a nesting site. Thus, whether it was nesting remains unknown. If it was, it seems unlikely that it provisioned a chick in 2022 or 2023. Although the individual was observed resting close to other

Fig. 2. Photograph of the melanistic Razorbill *Alca torda* from the Natural History Museum at Tring, UK (registration number NHMUK1987.24.283) showing the lack of the white loral line, a dark chest, and the lack of the white line formed by the tips of the secondaries. This specimen was part of Lord Walter Rothschild's collection, but no further information was found regarding the date or location of collection. The first mention of the specimen occurs in Sharpe (1893) on page 43. Photo copyright: Trustees of the Natural History Museum, London, England

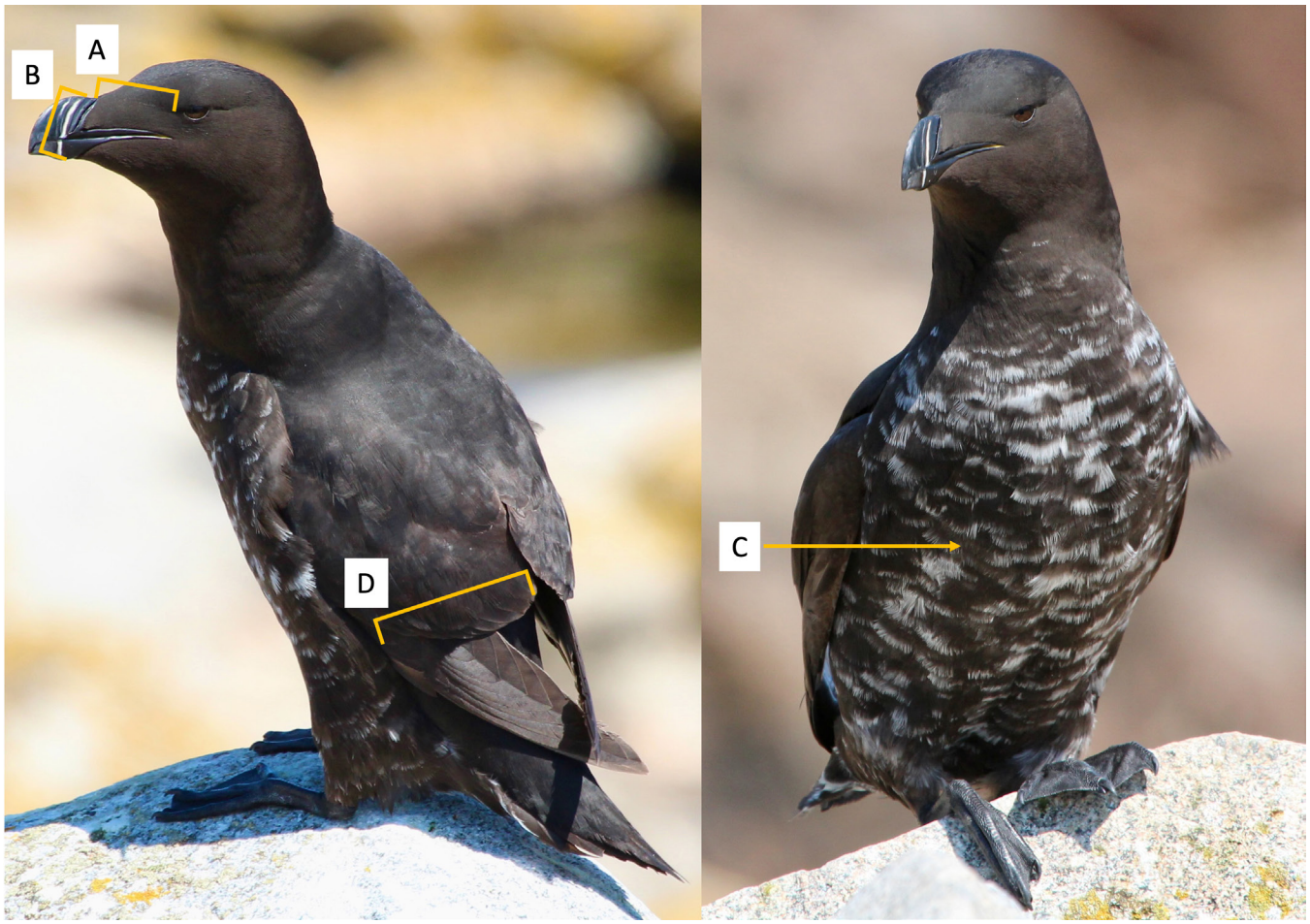

Fig. 3. Melanistic Razorbill *Alca torda* observed at Machias Seal Island, New Brunswick, Canada, highlighting the A) lack of the white loral line; B) white bill line; C) dark, scalloped underparts; and D) the lack of white line formed by the tips of the secondaries. Photo credit: Heather Major, Machias Seal Island, Canada, 2023

Razorbills on the colony, we did not observe it participating in any social interactions. We plan to continue checking for this individual in future years to assess whether we can find its nesting crevice, observe it bringing food into the colony, and document its social interactions.

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