



Breeding of Color-Aberrant Adélie Penguins at Cape Crozier, Antarctica

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Color variation within bird species is prevalent across many taxa. It can signal the fitness of an individual and be used in mate selection. Coloring differences may affect foraging efficiency, survival, and thermoregulatory abilities, which may have implications as the climate warms. While common in many species, color differences exist at a very low frequency in penguins.

Cape Crozier, Ross Island, Antarctica, is one of the largest Adélie penguin colonies in the world. Because of the unusually large size of the colony, it is one of the best places in the world to study extremely rare events, like color abnormalities.

The typical Adélie penguin has a black back, head and chin, a white belly, and a thin white eye ring. In the Antarctic summer of 2019-2020, we located and monitored all individuals with color abnormalities at the Cape Crozier breeding colony. We found twelve individuals for a frequency of ~1:50,000 breeding penguins.

Seven of the individuals were dark brown, a mutation not previously described in the scientific literature. One female was light brown, which is thought to be a sex-linked mutation that is only expressed in females. Three birds exhibited progressive greying, described as displaying white feathers interspersed in the normal black plumage. Finally, there was one male who was dilute or “washed out,” presenting as a gray bird.

We compared the fraction of abnormally colored individuals breeding to a sample of normally colored individuals and found that likelihood of breeding and successfully raising chicks was similar for both groups.

Our results show that having abnormal coloration does not necessarily impact a penguin’s ability to find a mate and successfully breed. It is possible that there are other impacts that we were unable to discern.

As the climate continues to change, it is important to

monitor the frequency of these mutations to see if certain colors are better suited to a different climate and become more prevalent with time.

Main Points

Adélie penguins typically have black backs and white bellies, a pattern that is thought to aid predator avoidance as well as avoid being detected by prey during foraging.

During the 2019-2020 breeding season, we found twelve individuals with color aberrations at Cape Crozier, one of the largest Adélie breeding colonies in the world. They existed at a rate of ~1:50,000, with brown penguins the most common variation.

If there is a disadvantage to having unusual coloration, it did not appear to affect breeding behavior as color-aberrants bred and were successful at similar rates to normal-colored penguins.

Levinson, P., Schmidt, A., Morandini, V., Elrod, M., Jongsomjit, D., & Ballard, G. (2021). [Breeding behaviour of colour-aberrant Adélie penguins \(*Pygoscelis adeliae*\) at Cape Crozier, Ross Island, Antarctica](#). Antarctic Science, 1-9. doi:10.1017/S0954102021000158 Publication #2345