

# Double-crested Cormorant with aberrant pale plumage

Jean Iron

## Introduction

A Double-crested Cormorant (*Phalacrocorax auritus*) with a strikingly pale plumage was reported by Darlene Deemert in Barrie, Ontario, on 5 October 2018. I photographed it on 7 and 9 October on its favourite perch at Heritage Park Marina. When photos and a video were posted on Facebook, Double-crested Cormorant researcher, Chip Weseloh, remarked: “I have never seen one this white in 40 years on the Great Lakes.” In this note, I describe this cormorant’s abnormal appearance and discuss how to determine the correct term for its aberrant pale plumage. Also included are comments about plumage and age, and behaviour.

Figure 1. Double-crested Cormorant’s abnormal brown plumage appears to have been bleached by exposure to sunlight. The spread-wing posture shows that the mutant brown colour is retained under the wings and on the flanks in areas that are not exposed constantly to sunlight. 7 October 2018.

Photo: Jean Iron





Figure 2. A mutant condition (see text) causes the plumage to bleach and be very worn.  
7 October 2018. *Photo: Jean Iron*

### **Description**

This unusual Double-crested Cormorant was a pale creamy white, approaching white on the breast and belly, with pale brown patches on the upper wing, and brown underwing coverts and flanks (Figures 1 and 2). The legs and feet were a dull pinkish-orange (Figure 1). The pupils were black and the irides were a normal bluish/brown (Figure 3). However, the bill was pale, and the gular pouch and the skin around

the bill and eyes were yellow. A close-up comparison of the facial features with a normal cormorant is shown in Figure 4.

### **Plumage Colour**

Melanins and carotenoids are the most important pigments that determine the colours of a bird's plumage. Carotenoids are the red, yellow and orange pigments in feathers. The black and dark brown plumages of birds are controlled by two types of melanins: eumelanin



Figure 3. Bill, gular area and skin around the eye lack normal pigments. The irides are the normal bluish-brown. 9 October 2018.



Figure 4. Comparison of aberrant Double-crested Cormorant with a normal cormorant. 9 October 2018.

*Photos: Jean Iron*

and phaeomelanin, which in turn rely on the presence of the enzyme, tyrosinase. If melanins are reduced, the plumage can be pale brown, creamy or even white. There are several ways for intricate processes to break down and produce a variety of unusual plumages. Colour aberrations in wild birds such as melanism (darker than normal) and leucism (lighter than normal) are uncommon but regular, whereas albinism is extremely rare. With input from aberrant plumage expert, Hein van Grouw, Senior Curator at The Natural History Museum in Tring, UK, the unusual colour of the Barrie Double-crested Cormorant is explained: Is it Albinism, Leucism, or another plumage colour mutation such as Brown or Ino?

### **Albinism**

Albinism is a severe and rare form of plumage colour aberration in which the enzyme tyrosinase is completely lacking and melanins cannot be produced in the feathers and soft parts, including the eyes (van Grouw 2006, 2013). It results in stark white areas of a bird's plumage, combined with pink eyes from the colour of the blood vessels showing through tissue without colour. Albino birds have poor eyesight because they lack the pigments that control eye colour and protect the eyes from the damage of UV light. These birds usually do not live long, probably because their ability to feed is compromised. Albinism does not involve carotenoids, so albino birds with red, orange and yellow in their plumage will still show those colours (van Grouw 2006, 2013). According to van Grouw (2006, 2013), there is no such thing as

a partial albino. The Barrie cormorant is not an albino. It has normally coloured eyes and the colour of its plumage is not all white.

### **Leucism**

The term leucism is familiar to birders as it has become a general term to describe birds with unusually pale or white plumages, but is it the correct term for the Barrie cormorant? Leucism is derived from the Greek word *leukos* meaning white. It is "the most frequently occurring inheritable colour aberration in birds" (van Grouw 2006). It is a partial or total lack of both melanins where the plumage can "vary from only a few white feathers (<25%) to totally white individuals (100%)" (van Grouw 2006). Leucism can also affect the soft parts and result in muted colour to the legs and bill, or these areas may have normal colouration. In all forms of leucism, the eyes are not affected as in albinism. Even though the Barrie cormorant has normal eye colour, it is not leucistic because its feathers are not white. They are pale brown, and some are further bleached by the sunlight (H. van Grouw, pers. comm.).

### **Brown and Ino Mutations**

"Brown" and "Ino" are two distinct types of mutations that result in washed out plumages like that of the Barrie cormorant (Harrison and van Grouw 2012, van Grouw 2013). In the Brown mutation, which is widespread in birds, changes to melanin pigments cause initially black feathers to turn brown. Eye colour is unaffected. In the Ino mutation, there is a reduction in the amounts of melanins making feathers that would typically be

black a pale brown instead. Eye colour is reddish, but vision is much better than in albinos (van Grouw 2013). Feathers resulting from both of these mutations are easily bleached by sunlight, causing them to turn whitish (van Grouw 2013).

To understand the unusual colour of this cormorant, I asked aberrant plumage expert Hein van Grouw for an interpretation. He said:

“The aberrant plumage colour of this Cormorant is the result of a mutation which affects the melanin synthesis and therefore original black remains dark-brown (as the melanin synthesis is incomplete). It may be the mutation Brown, although that mutation normally does not affect the skin colour (bill and feet) as much as in this individual. Another ‘candidate’ is a dark form of Ino. Both mutations, Brown and Ino, are sex-linked so this bird is most likely a female”

(H. van Grouw pers. comm.).

The Barrie cormorant best fits these categories, where the mutation has caused normal black feathers to be brown, then the sunlight has bleached them unevenly (Figures 1 and 2).

### Plumage and Age

Close inspection of the cormorant’s plumage shows that it is very worn compared to the neat, relatively unworn plumage of the normal juvenile cormorant beside it (Figure 2). Feathers on the upperparts are very scruffy at the tips, and tail feathers are worn to the shaft (Figure 5), indicating that it has not moulted recently. Feather replacement through moult is the only way to repair



Figure 5. Tail feathers are worn to the shaft. 7 October 2018. Photo: Jean Iron

damaged feathers. Possibly reflecting how uncommon plumage colour aberrations are in this species, the Double-crested Cormorant account in *The Birds of North America* (Dorr *et al.* 2014) discusses only normal plumages.

Regarding the cormorant’s age, Peter Pyle, a plumage and moult specialist, said that because white feathers wear at a much quicker rate than black feathers, this cormorant is a challenge to age based on feather shape alone. However, noting two generations of secondary wing feathers in the spread wing (Figure 2) and other indicators of moult, he aged it as after third year (ATY), which means it is at least in its third year of life or older (P. Pyle, pers. comm.).

### Vision, Behaviour and Survival

Consistent with the Brown mutation, the Barrie cormorant has normally-coloured eyes and several behaviours indicate that it has normal eyesight. I watched this cormorant diving for fish and it came up from dives at least half the time with a fish in its bill. This may have attracted Ring-billed Gulls (*Larus delawarensis*) to hover while it was diving;



Figure 6. Ring-billed Gull attempts to steal a fish. 9 October 2018. *Photo: Jean Iron*

they could also probably see it below the surface. When it surfaced, several times gulls tried unsuccessfully to grab its prey (Figure 6). Having a pale plumage could be a disadvantage, making it more visible to predators or birds that might parasitize it.

Observations and photos indicate that this intriguing cormorant perched,

preened and rested with other Double-crested Cormorants. There was no evidence of aggressive behaviour between the pale cormorant and other cormorants. They did not harass it or treat it as being different. The unusual colouration of this individual cormorant has apparently not affected its survival because it is now over two years old. It was still on

the Barrie waterfront on 23 October 2018 (D. Deemert, pers. comm.) and will likely migrate south before freeze-up. Its unique appearance should identify it if found again in another location.

### Conclusion

This Double-crested Cormorant is not technically leucistic. The aberrant pale plumage is likely the result of one of two possible genetic mutations (Brown and Ino) whereby the normal black feather colour is replaced by brown due to incomplete melanin synthesis. The feathers resulting from both mutations bleach in sunlight, causing the plumage to turn more whitish as in this individual.

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### Acknowledgments

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### Literature Cited

- Dorr, B.S., J.J. Hatch and D.V. Weseloh.** 2014. Double-crested Cormorant (*Phalacrocorax auritus*), version 2.0 In The Birds of North America Online (A. F. Poole, ed.). Cornell Lab of Ornithology, Ithaca, NY. <https://doi.org/10.2173/bna.441>
- Harrison, T. and H. van Grouw.** 2012. Abnormal Plumage Survey. Bird Table (British Trust for Ornithology), Spring 2012:14-15.
- van Grouw, H.** 2006. Not every white bird is an albino: Sense and nonsense about colour aberrations in birds. *Dutch Birding* 28:79-89.
- van Grouw, H.** 2013. What colour is that bird? The causes and recognition of common colour aberrations in birds. *British Birds* 106:17-29.

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### WANTED: Photos and notes on birds with aberrant plumage

In this issue (36:129-184) and the August issue (36:89-91) of *Ontario Birds*, our readers have seen spectacular images of an Eastern Kingbird and a Double-crested Cormorant with aberrant plumage. We were treated to a detailed and well-researched explanation of albinism, leucism, and Brown and Ino plumage mutations by Jean Iron in her article in this issue. We also received images of a pale coloured Gadwall. Many OFO members probably have other images or observations of Ontario birds with aberrant plumages which we think would make an interesting topic for a future issue of *Ontario Birds*.

Therefore, we are requesting readers who have made such observations to send us their photos of such birds with a short narrative (up to 10 sentences) describing the details (date, location, behaviours, etc.) of the record. If you have seen such birds and do not have a photo, we are still interested in your observations; so please send us your descriptive account (up to 10 sentences).

Photos and narratives will be reviewed by us and plumage experts and assembled into a special feature; we would hope to publish this account in the December 2019 issue of *Ontario Birds*. Material can be sent to any of the editors: [editors@ofoc.ca](mailto:editors@ofoc.ca).