

Articles

Erythristic Rose-breasted Grosbeak

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Description

On 5 May 2004, we observed three male Rose-breasted Grosbeaks (*Pheucticus ludovicianus*) eating sunflower seeds at our feeder in Toronto, Ontario. One of the grosbeaks was an aberrant male with extensive erythristic (red) coloration as shown on the front cover and in Figures 1 and 2. It stayed until 8 May during a period of cool weather. We aged it to be nearly two years old or older in definitive alternate (adult breeding) plumage based on its black folded primaries, which are visible in Figure 2. Year old birds in first alternate plumage show contrasting retained juvenal brown (not black) folded wingtips. In typical adult male Rose-breasted Grosbeaks in breeding plumage, the red colour is restricted to the wing linings, breast, and narrow extension down the centre of the breast (Godfrey 1986). Rarely the white rump and shorter upper tail coverts are pink (Wyatt and Francis 2002). The red on the underparts of the variant Rose-breasted Grosbeak was on the same area as the cinnamon-brown colour on a male Black-headed Grosbeak (*P. melanocephalus*), a close relative with which it hybridizes occasionally (Wyatt and Francis 2002). The rump

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was an impressive red colour also (Figure 2) instead of white as in most Rose-breasted Grosbeaks. Male Black-headed Grosbeak has a cinnamon-brown rump. Otherwise, the red variant's black and white feathering was similar to typical adult male Rose-breasted Grosbeaks in breeding plumage.

Discussion

Oberholser (1974) in his detailed plumage descriptions does not mention any variation in the extent of red on Rose-breasted Grosbeaks. Mutchler and Mutchler (1987) describe and illustrate small variations in the amount and shape of the red on the breast, but nothing like what we report here. There are no individuals with extensive red below or on the rump in the collections of the Canadian Museum of Nature (Michel Gosselin, pers. comm.), Royal Ontario Museum (Mark Peck, pers. comm.) and the Royal Alberta Museum (Jocelyn Hudon, pers. comm.). Alan Wormington (pers. comm.) has seen thousands of Rose-breasted Grosbeaks at Point Pelee, Ontario, but he has never seen or heard of one with extensive red coloration.

Jocelyn Hudon (pers. comm.)



Figure 1: Erythristic male Rose-breasted Grosbeak with red underparts extending to area normally coloured cinnamon-brown in male Black-headed Grosbeak. Photo on 6 May 2004 by Jean Iron.

of the Royal Alberta Museum, an expert on avian pigmentation, examined the photographs of the erythristic individual and provided a few educated guesses as to its origin. "It is as if the developmental program that dictates where the cinnamon (melanin) pigmentation is to appear on an adult male Black-headed Grosbeak was used to specify the location of red carotenoids in the variant Rose-breasted Grosbeak. This is not impossible if this program was the ancestral state in the lineage that gave rise to the

Rose-breasted Grosbeak and Black-headed Grosbeak (coloration like that of adult male Black-headed Grosbeaks is seen in few second calendar year male Rose-breasted Grosbeaks), which was subsequently modified in the lineage leading to the Rose-breasted Grosbeak to produce the pattern seen in that species today, except in the genetic variant, where the change was reversed. Alternatively, this state was reconstituted through genetic recombination following introgression with the Black-headed



Figure 2: Erythristic male's red rump is white (rarely pink) in typical male Rose-breasted Grosbeak and cinnamon-brown in typical male Black-headed Grosbeak. Photo on 6 May 2004 by Jean Iron.

Grosbeak. It is also conceivable that alterations in the program of pigment patterning in the Rose-breasted Grosbeak could produce individuals with red pigmentation over a wider area of the body (including the flanks and rump) than is currently observed, as sug-

gested by the occasional occurrence of males with pink rumps."

The red colour in Rose-breasted Grosbeaks is produced by a suite of red carotenoid pigments, mainly astaxanthin and canthaxanthin, which are manufactured through an oxidative process from yellow

carotenoid pigments acquired in the diet, presumably lutein and zeaxanthin (Hudon 1991). Both plant material (seeds, fruits) and insects that feed on plants are natural sources of dietary pigments (Jocelyn Hudon, pers. comm.).

Conclusion

This variant erythristic male Rose-breasted Grosbeak with red pigmentation extending to areas normally coloured cinnamon-brown in the Black-headed Grosbeak has implications for understanding the

way birds deposit pigments in some areas and not in others.

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