

AN ADULT MALE BLACKPOLL WARBLER IN FEMALE-LIKE PLUMAGE

CHRISTOPHER C. RIMMER AND JAMES R. TIETZ

Vermont Institute of Natural Science, 27023 Church Hill Road, Woodstock, Vermont 05091 USA

Abstract.—We describe a breeding male Blackpoll Warbler (*Dendroica striata*) in aberrant female-like plumage captured on Mt. Mansfield, Vermont, in 1998. The bird had been banded the previous summer in typical alternate-male plumage. This appears to represent the first documentation of a wild adult male bird in female-like alternate plumage. We suspect that the abnormal plumage reported here was due to hormonal influences on pigmentation. The bird's between-year change in appearance appeared to have no effect on its reproductive behavior.

MACHO ADULTO DE *DENDROICA STRIATA* EN PLUMAJE DE HEMBRA

Sinopsis.—Describimos un macho reproductivo de *Dendroica striata* en plumaje aberrante de hembra. El mismo fue capturado el Mt. Mansfield, Vermont, el 25 de junio de 1998. El ave fue anillado el verano anterior en el típico plumaje alterno de macho. Este parece ser el primer informe, claramente documentado, de un macho adulto silvestre en plumaje alterno de hembra. Sospechamos que el color anormal del plumaje fue influenciado por cambios hormonales. El cambio en el plumaje no parece haber tenido efectos en la conducta reproductiva del ave.

During the course of field research on montane forest birds on Mt. Mansfield (44°32'N, 72°49'W) in north-central Vermont, we encountered an aberrantly plumaged male Blackpoll Warbler (*Dendroica striata*). On 25 June 1998, JRT observed a color-banded Blackpoll Warbler in female-like plumage singing persistently from several song perches on an apparent breeding territory. On 8 July CCR mist-netted the bird as it approached an active nest with food. The nest contained four chicks estimated to be 3–4 days old and was also attended by a color-banded female Blackpoll Warbler in typical alternate-female aspect. CCR recorded detailed plumage notes and measurements on the bird, but was unable to obtain a photograph. He elected not to collect the individual, because of its association with an active nest and its value to long-term demographic research on this species on Mt. Mansfield. The nest failed during cold and wet weather on 10 or 11 July, possibly as a result of parental abandonment and subsequent exposure, and no further sightings of either adult were obtained during 1998.

The bird had a 72.0-mm wing chord, weighed 10.6 g, and had a moderately large cloacal protuberance (2 on a scale of 0–3) with no sign of a brood patch on 8 July. Despite its obvious physical and behavioral male attributes, the bird's plumage closely resembled that of an alternate-plumaged female Blackpoll Warbler. Its crown was greenish-gray with 10–12 feathers on the forecrown more heavily tipped with blackish than others. However, it entirely lacked the solid black-capped appearance of a typical alternate-plumaged male (e.g., Dunn and Garrett 1997; Pyle 1997). It had a small black pre-ocular spot and a very slight blackish post-ocular mark.

The mantle and back feathers were grayish-green overall, without distinct black centers; however, 8–10 feathers did have the prominent black central streaks typical of alternate-plumaged males. The rump and upper-tail coverts were grayish with very indistinct dusky centers. The lesser coverts were grayish green with little streaking. The median and greater coverts comprised mixed feather generations. The 5–6 proximal coverts on each wing were darker, fresher and more broadly tipped with white than the distal coverts, which were duller, grayer and more narrowly tipped with yellowish white. These differences correspond to the pattern expected following replacement of proximal coverts during the definitive prealternate molt of Blackpoll Warblers (Pyle 1997).

The bird's underparts were also female-like in appearance. The black malar stripe characteristic of male Blackpoll Warblers in alternate plumage was restricted to a few prominent but discontinuous streaks, giving a broken appearance to the stripe. Streaking on the chin, throat, sides and flanks was similarly scattered and less bold than on a typical male. The rest of the underparts were whitish with a slight grayish-yellow wash. In virtually all respects, the bird looked like a female with some male features.

Previous banding records of this individual revealed that it had been captured at a nearby site on 19 June 1998 by a co-worker during routine mist-netting operations. At this time, its wing chord measured 73.0 mm, it weighed 11.0 g, and it showed a small cloacal protuberance (1 on a scale of 0–3) with no sign of a brood patch. The bird was sexed as a female on the basis of its plumage characters, with no comments noted. More surprisingly, this Blackpoll Warbler had originally been banded by CCR in the same area on 22 June 1997, at which time it was sexed as a male on the basis of both its large cloacal protuberance (3 on a scale of 0–3) and its plumage. Its wing chord measured 72.0 mm and it weighed 11.6 g at this time. The fact that no comments were recorded on the field banding data form or in CCR's field notebook indicates that the bird must have been in typical alternate-male plumage. Thus, this individual's appearance apparently changed dramatically between the 1997 and 1998 breeding seasons. Despite intensive searching of this and nearby areas in 1999, we were unable to locate the bird and record additional observations.

To our knowledge, this represents the first documentation of a wild adult male passerine in female-like alternate plumage. While several published records of female birds in male-like plumage exist (e.g., Bergtold 1916; Stoddard 1921; Buchanan and Parkes 1948), we are aware of no aberrant male plumages in Blackpoll Warbler or any other species similar to the one described here. Two explanations seem possible: (1) that the bird failed to undergo its prealternate molt and retained its basic plumage throughout the summer; or (2) that its female-like feather pigmentation resulted from hormonal abnormalities.

We can dismiss the first possibility because the bird exhibited molt limits consistent with its having undergone a prealternate molt. Furthermore,

although the definitive-basic plumage of males and the definitive-alternate plumage of females are similar (Dunn and Garrett 1997; Pyle 1997; Hunt and Eliason 1999), we did not observe the extreme wear that might be expected if the bird had retained its contour feathers since its prebasic molt 10–11 mo prior. We are not aware of any documented records of a wild passerine completely foregoing a normal molt. However, a mid-September, 1974 sight record from Texas of a basic-plumaged Blackpoll Warbler in alternate male aspect (J. Dunn, pers. comm.) suggests that annual molts in this species may occasionally be skipped or greatly delayed.

We suspect that the abnormal plumage reported here was due to hormonal influences on pigmentation. Although gonadal, thyroid, and pituitary hormones exert varying effects on different feather pigments among different avian taxa (Voitkevich 1966; Ralph 1969), experimental evidence suggests that female-type plumage in males of some species may be produced by conversion of excess testosterone to estrogen (George et al. 1981). In those species in which sexual plumage dimorphism is under the control of estrogens, high concentrations of testosterone can lead to the adoption of female-like plumage (Owens and Short 1995). While testosterone levels are known to be influenced by day length (Payne 1972), it is difficult to account for factors that might have produced abnormally high levels of testosterone in the Blackpoll Warbler we examined in 1998. Elevated levels of thyroxine might also have produced the female-like plumage in this bird, possibly mediated by environmental influences such as temperature (Voitkevich 1966).

An extension to the theory of hormonal effects might be that the bird underwent its prealternate molt earlier than usual (February–May; Pyle 1997), before testosterone levels had reached levels that normally influence this molt. While seasonal effects on the coloration of replaced feathers are poorly known, adventitiously molted contour feathers in some male passerines can show female characteristics (Pyle 1997). Although such extensive, purely adventitious feather replacement seems unlikely in this case, it is conceivable that an early and prolonged prealternate molt might have produced female-like feathers among those earliest to molt and more typical male-like feathers late in the molt cycle, after testosterone levels had elevated. Whatever the causes of the unusual, between-year plumage changes that we observed in this Blackpoll Warbler, they appeared to have little or no effect on its reproductive behavior.

ACKNOWLEDGMENTS

We are grateful to the many colleagues who assisted our field efforts in 1997 and 1998. Special thanks are due to K. McFarland. We also thank the Mt. Mansfield Company for its logistic support of our work. J. Dunn and K. Parkes generously offered unpublished data and useful insights. Constructive comments by G. Clark, P. Hunt, K. McFarland, R. Mulvihill, and P. Pyle improved this manuscript. Funding support for our work on Mt. Mansfield in 1997 and 1998 was provided by the Conservation and Research Foundation, the National Fish and Wildlife Foundation, the Nuttall Ornithological Club, the Philanthropic Collaborative, the Thomas Marshall Foundation, the U.S. Fish and Wildlife Service, the Vermont Monitoring Cooperative, and the William P. Wharton Trust.

LITERATURE CITED

- BERGTOLD, W. H. 1916. Pseudo-masculinity in birds. *Auk* 33:439.
- BUCHANAN, F. W., AND K. C. PARKES. 1948. A female Bob-white in male plumage. *Wilson Bull.* 60:119-120.
- DUNN, J. L., AND K. L. GARRETT. 1997. A field guide to warblers of North America. Houghton Mifflin, Boston, Massachusetts.
- GEORGE, F. W., J. F. NOBLE, AND J. D. WILSON. 1981. Female feathering in Sebright Cocks is due to conversion of testosterone to estradiol in skin. *Science* 213:557-559.
- HUNT, P. D., AND B. C. ELLASON. 1999. Blackpoll Warbler (*Dendroica striata*). No. 431, in A. Poole and F. Gill, eds. *The birds of North America*. Academy of Natural Sciences, Philadelphia and American Ornithologists' Union, Washington, D.C.
- OWENS, I. P. F., AND R. V. SHORT. 1995. Hormonal basis of sexual dimorphism in birds: implications for new theories of sexual selection. *Trends Ecol. Evol.* 10:44-47.
- PAYNE, R. B. 1972. Mechanisms and control of molt. Pp. 104-158 in *Avian biology*, vol. 2 (D. S. Farner and J. R. King, eds.), Academic Press, New York.
- PYLE, P. 1997. Identification guide to North American birds. Slate Creek Press, Bolinas, California.
- RALPH, C. L. 1969. The control of color in birds. *Am. Zool.* 9:521-530.
- STODDARD, H. L. 1921. Female Bay-breasted Warbler in male plumage. *Auk* 38:117.
- VOITKEVICH, A. A. 1966. *The feathers and plumage of birds*. October House, New York.

Received 14 December 1999; accepted 7 November 2000.

