Condor 85:102–103

PLUMAGE CHARACTERISTICS OF JUVENILE BLACK-CHINNED HUMMINGBIRDS

FRANK A. BALDRIDGE

Various criteria useful in separating adult female and juvenile Black-chinned Hummingbirds (*Archilochus alexandri*) from similar species under favorable field conditions were discussed by Stiles (1971). My purpose here is to describe juvenal plumage characteristics of *A. alexandri* that appear to be reliable indicators of sex, and to present a key for age and sex determination in this species.

Plumages of Black-chinned Hummingbirds do not appear to have been studied in detail, as have those of Anna's Hummingbird (*Calypte anna*; Williamson 1956) and *Selasphorus* species (Aldrich 1956, Stiles 1972). Ridgway (1911) described juveniles as similar to adult females but with dorsal feathers terminally margined with buff, and throat coloration in juvenile females as immaculate, or with dusky spots and streaks smaller and less distinct than in juvenile males. Stiles (1971) stated that the throat coloration of adult females is highly variable and that the throats of juvenile males average darker than adult females, while juvenile females are less heavily marked. Short and Phillips (1966) observed that females have acutely pointed inner primaries (3–7) but that the subterminal notch is less distinct than in males. Stiles (1971) noted that the outer rectrices of adult females are bluntly pointed, and added that juveniles may lack this characteristic.

Between August 1978 and September 1981, I netted, banded, and released 212 Black-chinned Hummingbirds near Three Rivers, Tulare Co., California. The outer rectrices, fourth and fifth primaries (counting from inside), and representative feathers from the dorsum, throat, and primary coverts were obtained from 73 adult females and juveniles. These feathers were placed on notecards, along with band number, date, measurements, and other plumage notes. The degree of culmen corrugation (Ortiz-Crespo 1972) was also noted.

In analyzing these data, I separated adults from juveniles by the lack of culmen corrugations in the adults and by plumage characteristics (throat coloration of adult males and the absence of buff margins on dorsal feathers of adult females). Measurements of adults are summarized in Table 1.

All individuals determined to be adult females had a pointed fifth rectrix, though the degree of emargination and/or acuteness varied (Fig. 1a). In addition, the fourth and fifth primary remiges had a faint notch near the pointed, subterminal end of the inner web (Fig. 1d). Throat coloration was variable. Some individuals had immaculate throats (feathers with dark rachis and whitish webs; others had dark throats (feathers with rachis and webs entirely dusky except for a narrow white margin).

Individuals in juvenal plumage had buff margins on dorsal feathers (and on the primary coverts) and corrugations on the rhamphotheca of the upper mandible. Of 30 juveniles, I determined the sex of 24 (17 females, 7 males) by a conservative evaluation in which culmen characteristics (amount of corrugation and length) and, if present, purple feathers in the throats of juvenile males, were the primary factors considered. Six individuals could not be sexed with certainty on the basis of these characteristics.

In comparing the fifth rectrix and the fourth and fifth primaries between males or females (sex determined by the above criteria) I noted that males invariably had a pointed fifth rectrix (Fig. 1b), although the degree of emargination and/or acuteness varied. Also, the fourth and fifth primary remiges were pointed, with a faint notch on the subterminal end of the inner web (as in adult females). Females invariably had a more broadly rounded fifth rectrix (Fig. 1c) than males and their primaries were rounded on the subterminal end of the inner web (Fig. 1e). One female had apparently lost several outer rectrices on one side and replaced them: on one side, the outer rectrix was rounded (juvenal) while the corresponding rectrix on the other side was pointed (adult). A juvenile female with rounded outer rectrix and subterminal end of the inner web of the fifth primary was banded in 1979. When she was recaptured in 1981, the outer rectrix was acute and the fifth primary was pointed, with a faint notch at the subterminal end of the inner web. At both encounters her throat was immaculate.

Throat coloration of juveniles was variable. Some juvenile males had pale throats (feathers dark only near rachis and the web with wide whitish margins—sometimes with a buff wash). Because throat coloration in adult female and juvenile *A. alexandri* appears variable, even in the same age/sex class, this character appears to have little value in determining age/sex classes (other than adult males and possibly males in first prebasic molt). More reliable

TABLE 1. Measurements of *Archilochus alexandri*.

	Females		Males	
	Adults	Juveniles	Adults	Juveniles
Exposed culmen (mm)				
$\bar{x}$	20.35	20.24	18.25	18.20
SD	±.61	±.50	±.61	±.46
Range	19.1–21.9	19.6–21.5	17.2–19.3	17.2–18.6
n	31	17	27	7
Wing chord (mm)				
$\bar{x}$	45.65	46.42	42.35	43.75
SD	±.78	±1.28	±1.07	±.50
Range	43.0–47.0	44.0–49.0	40.0–45.0	43.0–44.0
n	27	12	26	4
Weight (gm)				
$\bar{x}$	3.51	3.61	3.05	3.12
SD	±.31	±.65	±.37	±.29
Range	2.9–4.2	3.0–5.8	2.7–4.3	2.8–3.7
n	33	18	29	7

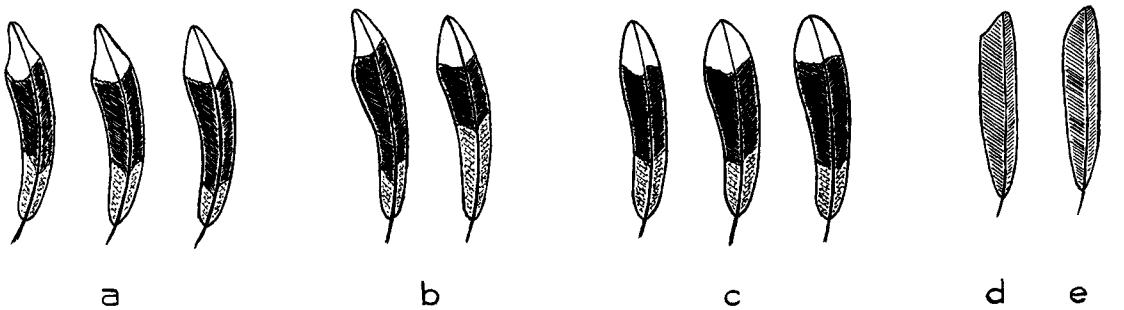

FIGURE 1. Variation in feather shape in adult female and juvenile *A. alexandri*. a = adult female rectrix 5; b = juvenile male rectrix 5; c = juvenile female rectrix 5; d = adult female and juvenile male primary remex 5; e = juvenile female primary remex 5.

plumage characters for determining sex of juvenile birds appear to be the shape of the fifth rectrix and the fourth and fifth primary remiges. These features are normally visible only in the hand.

In using the following key, care should be taken to note and evaluate as many characters as possible. Young juvenile females have a short exposed culmen. Older (late season) juveniles may have faint corrugations, but still possess buff-tipped feathers on the dorsum and primary coverts. Some individuals may have replaced lost juvenal rectrices and/or remiges. The amount of feather wear should also be considered. Fresh outer rectrices of adult females and juveniles often have a light buff or rufous tinge in the white tip; adult females have a very narrow buff margin on feathers of the dorsum in very fresh plumage (F. G. Stiles, pers. comm.). Use of weight alone in determining sex is not valid, especially in fall migration when many individuals are heavy.

KEY TO AGE AND SEX CATEGORIES OF BLACK-CHINNED HUMMINGBIRDS

1a. Throat metallic purple; outer rectrix narrow and all black ..... adult males
1b. Throat not purple; outer rectrix tricolored 2
2a. Culmen without corrugations and longer than 19.0 mm; dorsal feathers and primary coverts without obvious buffy margins ..... adult females
2b. Culmen with corrugations and/or dorsal feathers and primary coverts with buffy margins 3
3a. Rectrix 5 pointed, often with some degree of emargination of distal end of inner web (Fig. 1b); primaries 4 and 5 pointed with a faint notch at subterminal end of inner web (Fig. 1d); exposed culmen less than 19.0 mm ..... juvenile males
3b. Rectrix 5 rounded at tip (Fig. 1c); primaries 4 and 5 rounded at subterminal end of inner web (Fig. 1e); exposed culmen usually longer than 19.0 mm ..... juvenile females

I am indebted to the U.S. Fish and Wildlife Service–Bird Banding Laboratory for the opportunity to band hummingbirds. F. Gary Stiles surveyed hummingbirds in the University of California at Los Angeles-Dickey Collection with regard to rectrix shapes and provided useful comments. The manuscript benefited from review by L. C. Binford, A. R. Phillips, and L. F. Kiff. I am grateful to Gertrude Schuckert of Three Rivers for allowing access to her property and to my wife Susan and son Jed for assistance in the field. This study was supported in part by Ed N. Harrison and the Western Foundation of Vertebrate Zoology.

LITERATURE CITED

ALDRICH, E. C. 1956. Pterylography and molt of the Allen Hummingbird. Condor 58:121–133.

ORTIZ-CRESPO, F. I. 1972. A new method to separate immature and adult hummingbirds. Auk 89:851–857.

RIDGWAY, R. 1911. The birds of North and Middle America. U.S. Natl. Mus. Bull. 50. Pt. 5.

SHORT, L. L., AND A. R. PHILLIPS. 1966. More hybrid hummingbirds from the United States. Auk 83:253–265.

STILES, F. G. 1971. On the field identification of California hummingbirds. Calif. Birds 2:41–54.

STILES, F. G. 1972. Age and sex determination in Rufous and Allen hummingbirds. Condor 74:25–32.

WILLIAMSON, F. S. L. 1956. The molt and testis cycle of the Anna Hummingbird. Condor 58:342–366.

Western Foundation of Vertebrate Zoology, 1100 Glendon Avenue, Los Angeles, California 90024. Received 8 February 1982. Final acceptance 4 September 1982.