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REPORT ON AGING AND SEXING CRITERIA FOR AMERICAN REDSTART

DANIEL R. GRAY III

For several years I have heard argument on the validity of the presently available aging and sexing criteria for the American Redstart (*Setophaga ruticilla*). I felt it necessary to solve this problem before I continued to report age and sex on redstarts to the Bird Banding Laboratory. First I read all the resources available to me on plumage and age/sex determination of this warbler. Then I tested the reliability of my findings with study skins.

After reading several authorities, patterns of agreement emerged similar to the criteria many banders now use. The criteria and figures given below resulted from age/sex determination by plumage characteristics only; skull ossification was not obtainable with the study skins.

Black and orange birds	ASY MALE	spring
	AHY MALE	fall

Grayish birds with orange breast patches and yellow underwings, usually contrasting (SY Males often with black on head and throat)	SY MALE	spring
	HY MALE	fall

Grayish birds with yellow patches and yellow underwings, little or no contrast	AHY FEMALE	spring
	U FEMALE	fall

Using the above guide, basically that put forth by Robbins (1964) and Wood (1969), I tested my findings with study skins. ASY/AHY Males checked out with 0% error. SY/HY Males showed a 19.1% error. AHY/U Females had a 3.7% error. Obviously in the fall much more accurate results can be obtained for adult females by using skull ossification along with plumage. Identifying SY Males and AHY Females in the spring, when skull condition is not helpful, seemed a possible problem. Identifying SY Males by plumage as above produced a 14.6% error. (Table 1). An unofficial statement from the Banding Laboratory indicated that the percent of error for banding criteria should be 1% or less.

Other interesting plumage characteristics I found were:

Two birds were marked female on the museum label and had black body feathers and orange breast patches. On one the black was on the breast, throat, forehead and lores. On the second, black was on the breast, mid-back, and crown. This indicated that the presence of black feathers may not be totally reliable in separating SY Males from females. However, the sample of

birds with black feathers was too small to be statistically conclusive.

One spring female with orange breast patches and underwing linings had stronger orange than a large number of similarly plumaged spring males.

Only one bird with a strong tint of green in its yellow breast patches failed to be a female.

As I studied the resource books, I was aware of many qualifying statements when separating redstarts into age and sex groups by plumage. Bent (1953), who uses Dwight as his plumage source, states while describing the adult female: "Some specimens are much like males." In another spot Bent reiterates: "One should be careful to avoid mistaking the young male for the female....as a rule however, the young Spring male has some black feathers on the underparts, a character not shown by the female."

Chapman (1917) finds these same black feathers in a pair of fall males. He also says that the HY male "Generally resembles adult females in Spring...but the patches at the sides of the breast average deeper in tone." This indicates that he did not find as clear a yellow/orange breast patch distinction between females and young males as some authorities.

Forbush (1929) states: "Immature male in first breeding plumage: Closely resembles adult female in breeding plumage, from which it is sometimes indistinguishable."

Roberts (1932) describes the adult breeding female and second year breeding male together, making no distinction between them except for "a few black feathers usually present on head, neck, and breast of male."

Considering the above information I feel that at this time the following criteria is the safest to use for determining the age and sex of American Redstarts:

Black with orange breast, wing, and tail patches	Jan-Jun	ASY Male
	Jul-Dec	AHY Male
Grayish with yellow to orange breast, wing and tail patches	Jan-May and June with ossified skull	AHY-U
	Jun- ?? with unossified skull	HY-U
	Jul- ?? with ossified skull	AHY Female

I am particularly indebted to the staff of the American Museum of Natural History for making their skin collection available to me and for their advice and information. I would

like to thank the many banders of the Island Beach Banding Station, particularly Mrs. Katherine G. Price, for the hours of sharing and brainpicking that made me ware of the redstart controversy and stimulated me to seek an answer.

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TABLE 1. Reliability of Criteria Used to Age and Sex American Redstarts.

Age/Sex Identification ¹	Sample Size ²	Mistakes ³	% Error
ASY Male	105	0	0.0%
AHY Male			
SY Male ⁴	89	17	19.1%
HY Male			
AHY Female	109	4	3.7%
HY Female			
Removed from Sample ⁵ (a,b,c)	47	-	-
Total	350	21 ⁵ (c)	-

¹Age/Sex determined by using criteria initially stated in this paper.

²Sample was taken from the collection of the American Museum of Natural History, New York City, Floor 5, Cabinet 250, drawers 19, 20, and 22.

³A mistake was assumed when the museum label differed with the sex or age assigned while using key given at beginning of this paper.

⁴Of the 41 spring males in this group, 6 keyed incorrectly giving a spring percent of error of 14.6%.

- ⁵ (a) Fourteen (14) birds were too indefinite in plumage characteristics to be keyed with the criteria used.
- (b) Twenty (20) birds were not sexed on the museum label.
- (c) Originally 34 mistakes were found when the 350 birds were keyed. Thirteen (13) of the 34 were removed from the sample because the collector and/or identifier were not considered reliable. Collectors and/or identifiers considered reliable by the museum staff were J. Dwight (13 birds), T.P. Carter (1), S.B. Gabaldon (1), Robertson (1), Thurber (1), Brainerd (1), Bandish (1), D.G. Elliot (1), W. Dutcher (1).

REQUEST FOR INFORMATION

I would greatly appreciate other banders publishing or sending me information that supports or refutes my findings as I shall continue to look for better criteria for aging and sexing redstarts. I would particularly appreciate information on the presence or absence of:

- repeat or recovery records of redstarts where plumage was carefully checked each time, indicating either the accuracy or inaccuracy of the age/sex determination methods used.
- July to December birds with black flecks on back, breast, and head. (Please note that if you blow aside the feathers surrounding the ear of most redstarts you will find the mid to basal portions of the feathers black or very dark.)
- July to December birds with orange side of breast and/or underwing and a completely ossified skull.

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(Article received March 13, 1973)



A NUMERICAL CRITERION FOR AGING BY IRIS COLOR IN THE GRAY CATBIRD

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The Gray Catbird (*Dumetella carolinensis*) is a common breeder over much of North America and is frequently encountered in banding operations. The aging of these birds relies on the characters of crissum feather type, mouth color and iris color (Wood, 1969). These are qualitative criteria and are at times difficult to implement, but I have found that iris color determination can be quantified using the Munsell color system, and this paper presents some results.

The technique for iris color determination is described in a previous paper (Wood and Wood, 1972) and involves comparing the bird iris directly with an abbreviated set of color standard charts. The charts are prepared specifically by the Munsell Color Company to test soil colors, which contain the red and yellow hues commonly found in birds' eyes. Furthermore the color standards are mounted with a hole in the page next to the color chip so the object to be viewed (in this case a bird's iris) can be placed adjacent to the standard. The numerical index of the standard with the closest match to the bird's iris is recorded as the numerical representation of the iris color. To ensure a correct match the comparison is done in strong daylight. The Munsell system breaks a color down into three characters: hue, the redness, yellowness etc. of the color; value, the lightness or darkness of the color; and chroma, the intensity of the color from very pale to very vivid. Thus each color is numerically stated with three terms each separated by an oblique in the order indicated above. For example, 10/3/8 would read, hue of 10, a reddish color, value of 3, rather dark, and chroma of 8, very intense. This would be a very strong dark red--the color of the eye of an adult Red-eyed Vireo (*Vireo olivaceus*).

In studying the iris color of the Gray Catbird, 93 observations of 75 individuals trapped in south-west Ohio and New Jersey, north of 39° latitude were used. I found no evidence that the iris color of catbirds in Ohio differed from those in New Jersey