News, Notes, Comments

Preformative Molt in Indigo Buntings North of the Wintering Grounds

The preformative molt undertaken by the three North American breeding *Passerina* buntings has been well studied, particularly in the Indigo Bunting (*Passerina cyanea*). The sequence of molt and plumages was first described for the Indigo Bunting by Dwight (1900), later refined by Rohwer (1986), and again by Pyle (1997a and b). Rohwer (1986) discovered a previously undescribed molt by hatching year (HY) Indigo Buntings. He called it "presupplemental molt" and described how HY birds replace their rectrices, outer primaries and inner secondaries. We now know this molt as the preformative molt that produces the formative plumage (Howell et al. 2003). While studying specimens to describe this newly discovered molt, Rohwer (1986) determined that greater than 90% of HY Indigo Buntings start their preformative molt after November 15th upon reaching the wintering grounds.

We became interested in the timing and extent of the preformative molt for Indigo Buntings when we noticed several HY individuals in the process of replacing flight feathers in the fall. During daily banding operations from August through October 2012 and 2013, we examined wing-feather molt in the primary coverts, primaries and secondaries on HY Indigo Buntings. Birds were captured and processed at two locations located less than a mile apart run by the Chester River Field Research Station (39°23" N, 76°00" W): a restored grassland and a long-term migratory banding station, Foreman's Branch Bird Observatory, located on the Eastern Shore of Maryland. Indigo Buntings breed and migrate though our study area. Thus, our HY individuals exhibiting wing feather replacement were doing so before and during migration from North America to tropical wintering grounds. Here we report the relative frequency of wing feather replacement between male and female HYs and report that a small percent of individuals suspend wing feather molt during migration. In addition, we add Indigo Bunting to the growing list, as the 8th passerine, of HY birds that can undergo a typical and eccentric molt sequence concurrently during the preformative molt.

We examined 733 HY Indigo Buntings to determine the extent to which primary coverts, primaries and secondaries were replaced during the preformative molt. The number of feathers in molt was recorded for the right wing on all birds and on the left wing when time allowed. No significant differences were observed between number of feathers replaced between right and left wing (Kolmogorov-Smirnov D=0.0479), so we restricted our analysis to data on right wings only. The molt patterns were commonly eccentric and the initiation point of molt within each feather tract was highly variable among individuals. Despite this variation within the sample, the average starting foci of flight feather replacement was similar between males and females (Table 1). Of the 733 individuals assessed, 77 (11%) had replaced at least one feather in either the primary covert, primary or secondary feather tracts. Average number of feathers replaced varied between feather tracts for those birds exhibiting molt limits (Table 1).

The majority of the 77 individuals that started the preformative molt exhibited the expected eccentric incomplete molt patterns: among males 81.1% (43) had eccentric patterns, 5.7% (3) showed typical molt, 1.9% (1) showed both and 9.4% (5) molted only the tertials; among females 80.0% (20) had eccentric patterns, 8.0% (2) had typical patterns, 4.0% (1) showed both and 8.0% (2) molted only the tertials. Though only a small percent of the sampled individuals showed both typical and eccentric molt patterns concurrently this was previously undescribed for Indigo Buntings (see Pyle 1997a, b, and Small et al. 2013 for the seven other species documented to show these molts concurrently). Overall, over twice the number of males (68%) had started their preformative molt compared to females (32%) when they were captured, though the average number of individual feathers replaced by females were greater but not significantly so (D=0.306, see Figure 1).

Table 1. Average number of wing flight feathers replaced and average starting foci for hatching year Indigo Buntings during the preformative molt prior to reaching the wintering grounds.

		n	PP Covs	Primaries	Secondaries
Average Replaced	Male	52	2 (1-3)[1]	4 (1-8)	3 (1-9)
	Female	25	2 (1-6)	6 (2-9)	4 (1-9)
	Combined	77	2	5	3
Average Starting Foci[2]	Male	52	7 (1-7)	5 (1-9)	6 (1-9)
	Female	25	6 (1-9)	4 (1-5)	6 (1-8)
	Combined	77	6	4	6

[1] Numbers in parenthesis are ranges.

[2] Numbers in the pp cov, primaries and secondaries columns are the average initiation point for the molt, i.e. the 6 in the pp cov column is the 6th pp cov, which was the average starting foci for females during the preformative molt. PP covs and primaries numbered distally and secondaries numbered proximally.

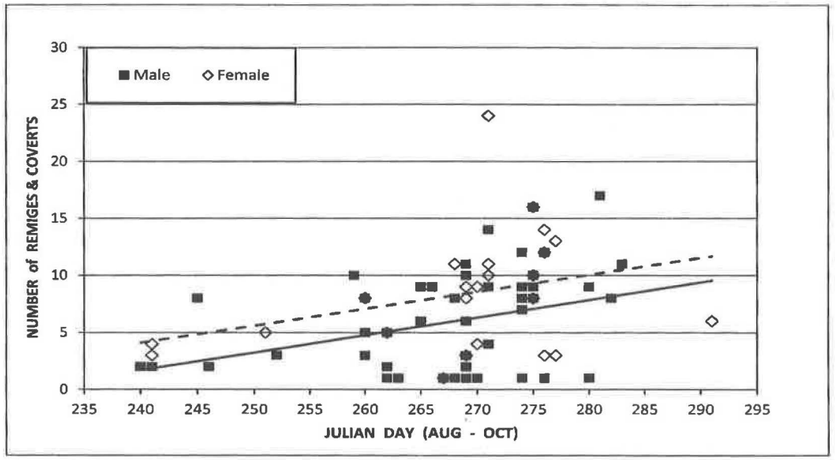

Figure 1. Total number of primary coverts, primaries and secondaries replaced by hatching year Indigo Buntings during the preformative molt prior toFall migration. Linear regression: males (solid line) y = 0.1535x - 35.153 R2 = 0.1174; females (dotted line) y = 0.1483x - 31.486 r^2 = 0.1021.

Greater numbers of primaries, primary coverts and secondaries were replaced as the season progressed for both males and females (Figure 1). Our findings support those of Rohwer (1986) that approximately 10% of our HY Indigo Buntings started their preformative molt prior to migration.

In the 77 cases where new feathers were detected, primary coverts and primaries were always molted distally and secondaries always were molted proximally (excluding the tertials). The majority of these individuals (49) had completed their preformative molt when they were examined.

Eighteen individuals were still in active molt and ten birds had suspension molt limits with a combination of retained outer primaries, inner secondaries and in one case retained outer primary coverts. Of the birds that started molting their primaries, the average number of feathers retained was four (range 1-8), the average number of secondaries (excluding the tertials) retained was seven (range 6-8). Only one individual had suspension limits in the primary coverts. This individual had started molting at primary covert one and suspended the molt at primary covert three, resulting in the retention of the six outer feathers.

Suspension limits for birds that undergo incomplete eccentric preformative molts are uncommon but have been documented in some tyrant flycatchers (Pyle 1997a) and possibly in the Lesser Goldfinch, *Pinus psaltria* (Howell 2010). To our knowledge, this is the first documented case of HY Indigo Buntings suspending wing feather replacement during migration.

A plausible driver for the small percent of the population molting prior to reaching the wintering grounds is variation in hatch date. We hypothesize that these few birds with unusual molts are the earliest nestlings to fledge. Birds that fledge early have more time to initiate and complete the preformative molt prior to migration than individuals hatched later.

Banders should be alert for other passerines that undergo eccentric preformative molts where birds may replace flight feathers away from traditional sites reported in the literature and for birds that may replace additional feathers during this molt.

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Whither for *North American Bird Bander?*

Introduction

As a bander for more than 60 (gasp!) years, I have always been an avid reader of the *North American Bird Bander (NABB)* and its predecessors, although I have never been involved editorially. Now, after decades of patronage, perhaps it is an appropriate time to examine the objectives and future direction of *NABB*.

As I see it, *NABB*'s objectives have always been to provide a quality journal focused on keeping banders informed of developments in their field and news of the three associations, while stimulating a healthy membership base for each banding associations. As a note, all three associations, over the last decade or two, have had a slight but perceptible and steadily declining membership – a trend that I hope can be reversed by increasing the capacity of each association to provide meaningful products and representation to their respective communities.

Background

Prior to *NABB*, we had newsletters from the three Associations. Over time, the need for a common source of news, updates, and pertinent research led