

DELAYED MOLT IN THE PINE SISKIN

BY ROBERT P. YUNICK

During November 1975, an especially early and heavy invasion of Pine Siskins (*Spinus pinus*) was experienced at my home banding station. This appearance provided an opportunity to record some of the last phases of molt in this species, and to encounter some individuals that appeared to be unusually late in completing their molt. This paper summarizes these observations.

From among the 91 November birds judged to be adult by the completion of skull pneumatization, two individuals were still in their prebasic (postnuptial) molt. They had already renewed their rectrices, but were still renewing primaries and secondaries. The body molt of the first bird was complete whereas that of the second was complete except for a very small amount of sheathing on the breast feathers. The first bird, which was caught on 18 November, had completely regrown P-1 through 7 ("P" and "S" are used throughout to designate primary and secondary, respectively). They were fresh and unworn. P-8 was incompletely grown and measured 50 mm. Normally a bird of this size (72-mm wing chord) would have a primary measuring 57 mm (range: 54-58 mm for all wing chord lengths). P-9 was still sheathed and measured 26 mm, and normally would also be 57 mm. S-1 and 2 were fresh and fully grown. S-3 was 36 mm and typically is 40 mm (range: 38-41 mm) when fully grown. S-4 through 6 were old, worn and faded in comparison.

The second bird was caught on 27 November. P-1 through 8 were fresh and completely regrown. P-9 was still sheathed and measured 43 mm compared to a typical, fully grown remex of 57 mm. The secondary molt in this bird was unusual in that it was not occurring in normal ascending order. S-1 through 3 were new. S-4 was sheathed and measured 17 mm compared to a fully grown remex of 40 mm. S-5 was new and fully grown; S-6 was old and worn.

In each of these birds, the molt patterns were symmetrical. Also, the tertials, alulae, and all of the upper wing coverts had been replaced as evidenced by their fresh, unworn condition. Based on my experience with related adult fringillids such as Purple Finch (*Carpodacus purpureus*) and Dark-eyed Junco (*Junco hyemalis*) on their nearby breeding grounds, prebasic molt of flight feathers begins in July and is normally complete in most, but not all, individuals by late September with the Purple Finch molt extending into early October. Dwight (1900) indicates that the prebasic molt of the Pine Siskin takes place in August. These two siskins were about two months later than these related species in completing this molt, and three months later than the timing given in Dwight.

In addition to the two birds in flight feather molt referred to above, a small percentage of birds showed evidence of body molt well into the fall and winter. This molt appeared as sheathed feathers on the crown and upper breast. It was detected when

either the skull was moistened for examination of pneumatization, or when the breast feathers were blown aside during an examination for fat deposits. In most of these birds, this molt would not have been apparent if the plumage had not been disturbed during examination. Only birds with substantial sheathing (more than 10 sheaths in either area) were regarded as being in molt. Lesser numbers of birds showed an occasional trace of sheathing. The occurrence of this molt is summarized in Table 1.

Considering the timing and nature of this body molt, it is believed to be principally, but not exclusively, a characteristic of immature birds. Of the 86 molting birds, 86.0 percent were known to be immature based on skull examination. Since some of the December and January captures of molting birds with completely pneumatized skulls were made at a time when pneumatization is complete in some immatures (Yunick, Ms.), an even higher percentage of these birds may have been immature. Based on my experience with immature Dark-eyed Juncos and Purple Finches on their Adirondack Mountain natal grounds, and with various sparrows at Vischer Ferry, New York and Island Beach, New Jersey in September and October, the first prebasic molt is complete in almost all immatures by late September and may last into mid-October in a few individuals, particularly with the Purple Finch. The molt noted in these siskins lasted two to four months beyond this period. Among the molting immature siskins captured in November, an high proportion of them showed the least extent of skull pneumatization of all of the immature siskins handled. Judging from their skull condition, they appeared to be relatively young birds that may have fledged as late as August-September.

Forbush (1929) describes their breeding as very irregular and occurring between March and August with probable double-brooding in many cases. He cites a Vermont record of young ready to leave the nest on 19 March 1925, and he gives egg dates of 18 March for New York and 9 to 29 May for Massachusetts. Bull (1974) lists egg dates for New York of 25 April to 25 May, a record of a nest with eggs on 20 July 1893, nestling dates of 13 April to 10 June, and fledging dates of 11 June to 16 July.

My own observations are consistent with the irregular pattern portrayed above. During their return spring flights, I have encountered transient Pine Siskins in breeding condition at my home station. I have captured females with brood patches as early as 25 April 1972 (migrants continued to be caught to 21 May), 1 May 1974 (migrants continued to be caught to 15 May), and 7 April 1976 (migrants continued to be caught to 16 May). Also, I captured a bird with a brood patch about 75 percent developed on the very early date of 26 February 1976. Males with cloacal protuberances were captured as early as 7 May 1972, 2 May 1974, and 13 April 1976.

On 13 May 1976, a newly fledged juvenile was captured and banded. It represented the first such capture of an immature during any of these spring flights. Unlike a bird that would have fledged locally, it did not remain at the feeder, but chose to move on with the last of the adults that were passing through at the time.

TABLE 1
Molt and capture data on fall and winter Pine Siskins

Banding Period	Number banded			Total		Number in molt			Total	Percent of immatures (SIP) in molt	Percent of all birds in molt
	SCP ¹	SIP ²	U ³	SCP	U	SCP	SIP	U			
1-10 Nov.	8	18	0	26	0	2	0	0	2	11.1	7.7
11-20 Nov.	11	57	0	68	1	8	0	0	9	14.0	13.3
21-30 Nov.	72	213	5	290	3	32	2	2	37	15.0	12.8
21-31 Dec.	68	60	1	129	2	13	0	0	15	21.7	11.6
1-10 Jan.	43	44	0	87	3	5	0	0	8	11.4	9.2
11-20 Jan.	67	36	0	103	3	9	0	0	12	25.0	11.6
21-31 Jan.	36	8	0	44	0	3	0	0	3	37.5	6.8
1-10 Feb.	47	7	0	54	0	0	0	0	0	0	0
11-20 Feb.	0	0	0	0	0	0	0	0	0	—	—
21-28 Feb.	6	0	0	6	0	0	0	0	0	0	0
1-10 Mar.	4	1	0	5	0	0	0	0	0	0	0
11-20 Mar.	6	0	0	6	0	0	0	0	0	0	0
21-31 Mar.	7	0	0	7	0	0	0	0	0	0	0

¹SCP = skull completely pneumatized²SIP = skull incompletely pneumatized³U = unknown age

Note: No banding was done in early December. Considerable banding was done during 11-20 February, but no new siskins were captured.

I have also encountered breeding adults and their offspring at my Jenny Lake banding station in the Adirondack Mountains 52 km (32 mi) north of my home station. After the heavy flight of 1971-72, Pine Siskins lingered there to breed, and 18 adults with well developed brood patches and cloacal protuberances were caught in late May. Ten recently fledged young were banded between 6 and 15 July after which the species left the feeders and disappeared from the immediate area. In marked contrast, in 1973 there was a much reduced flight (I caught only three in my yard vs. 1,267 in my yard in 1972), but the species bred again at Jenny Lake. I began capturing adults with well developed breeding characteristics on 6 May 1973. The first young were caught on 13 May, and by 27 May nine young, 20 adult females, 27 adult males and two adults of unknown sex were banded. Again, the birds did not stay to feed, but abandoned the area in June.

Based on these two differing breeding encounters at Jenny Lake, and on literature reports, it is not unrealistic to expect that some individuals breed very late in the season and give rise to a group of young that possess molting traits well into winter. Based on the November bandings, only 14.6 percent of the 288 immature birds showed this delayed molting trait indicating that late breeding is not very common. Beyond November when completion of pneumatization in young birds influences the reliability of skull pneumatization as an age indicator, the proportion of recognizable immatures in molt increases to the end of January, at which time molt is complete. The reason for this increase is that as time progresses, fewer immatures are recognizable as such based on skull examination, because completion of pneumatization is increasing at a rapid rate in December and January. At the same time, the proportion of all birds in molt steadily decreased from mid-November until it finally reached zero in early February.

LITERATURE CITED

- BULL, J. 1974. Birds of New York State. Garden City, N.Y., Doubleday/Natural History Press.
- DWIGHT, J., JR. 1900. The sequence of plumages and moults of the passerine birds of New York. *Annals N.Y. Academy of Sciences*, **13**, No. 2: 73-360.
- FORBUSH, E. H. 1929. Birds of Massachusetts and Other New England States, Norwood, Mass., Norwood Press.

1527 Myron Street, Schenectady, New York 12309. Received 27 April 1976, accepted 28 June 1976.