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Natal pterylosis of phoebes.—Detailed accounts of natal pterylosis currently are available for only a small percentage of the species of passerine birds of the world. The perception that natal down patterns have only limited value as taxonomic characters (Collins and Kemp 1976) and provide little information about concealing coloration or thermoregulatory ability has not engendered much support for further studies. As a result, the necessary specimens most often only are collected coincidental to other field studies (Marra 1990). As a result, the species coverage is spotty and is plagued by small sample sizes (Collins 1990). We present here data on three *Sayornis* flycatchers. This constitutes one of the few comparative analyses among all species of a single genus (see also Minsky and Collins 1983).

The genus *Sayornis* consists of three widespread and commonly occurring species of tyrant flycatchers: Eastern Phoebe (*Sayornis phoebe*), Black Phoebe (*S. nigricans*), and Say's Phoebe (*S. saya*). The breeding biology of all three species has been described by numerous authors (Bent 1942, Schroeder 1985 and references therein). All three species build shallow open-cup nests placed on a supporting structure, usually in a covered place, and in Eastern and Black phoebes, near water. Although many aspects of the breeding biology of phoebes is known in detail, the natal pterylosis has been described only for the Eastern Phoebe (Wetherbee 1957). As part of a continuing survey of natal pterylosis in passerine birds, we present here similar observations on both Black and Say's phoebes and review the pattern of natal pterylosis in the genus.

Wetherbee (1957:358–359; Table 4) reported information on the Eastern Phoebe based on 17 specimens collected in Maine, Massachusetts, Wisconsin and Michigan. Included were one late stage embryo, 10 newly hatched chicks (Stage A, Wetherbee 1957:356), five older chicks (Stage B) and one late-teleoptile stage chick with the sheaths of the pin feathers ruptured (Stage D).

Three Black Phoebe specimens were available for this study. A newly hatched chick (Stage A) and two early pin feather stage chicks (Stage C) were collected from nests on Rainbow Creek, San Diego County, California, on 17 May and 24 May 1983, respectively. An additional nearly fledged chick (late Stage D) was used for study of feather tract arrangement, but since down had probably been lost through abrasion, it was not included in the neossoptile counts for the species. Say's Phoebe was represented by two chicks (Stage B) collected from a single nest near China Lake, Inyo County, California, on 8 May 1974.

All specimens were examined under a binocular dissecting microscope and the number and distribution of natal downs (neossoptiles) in each species were recorded (Table 1). The terminology for neossoptile tracts and regions within tracts follows that of Wetherbee (1957).

TABLE 1
AVERAGE NUMBER (AND RANGE) OF NEOSSOPTILES PER TRACT OR REGION IN *SAYORNIS* PHOEBES

	Eastern Phoebe[a]	Black Phoebe	Say's Phoebe
Ocular	18 (13–22)	14 (13–14)	17 (15–18)
Infraocular	0 (0–1)	0 (—)	0 (—)
Coronal	14 (9–17)	11 (9–12)	13 (12–15)
Superciliary	0 (0–2)	0 (0–1)	0 (—)
Auricular	19 (16–20)	13 (12–14)	16 (13–18)
Postauricular	2 (0–5)	3 (1–4)	0 (—)
Occipital	10 (4–16)	6 (4–8)	10 (8–11)
Middorsal	10 (5–15)	5 (3–10)	9 (8–9)
Pelvic (medial)[b]	7 (5–9)	4 (1–6)	3 (3–3)
Pelvic lateral	0 (—)	0 (0–1)	1 (1–1)
Interscapular[b]	0 (—)	0 (0–1)	5 (3–6)
Scapular	12 (9–14)	7 (5–9)	13 (12–14)
Femoral	12 (10–13)	10 (8–13)	9 (6–11)
Ventral cervical	0 (0–5	0 (—)	0 (—)
Abdominal	14 (10–15)	10 (8–12)	14 (8–19)
Axillars	3 (0–5)	0 (—)	0 (—)
Crural	10 (6–12)	6 (4–7)	10 (8–12)
Rectrix	6 (6–6)	5 (4–6)	4 (1–6)
Upper rectrix coverts	4 (0–4)	2 (1–3)	4 (3–4
Primaries	0 (—)	8 (7–9)	9 (7–10)
Greater primary coverts	8 (5–9)	2 (0–6)	9 (8–9)
Secondaries	1 (0–3)	5 (1–9)	8 (8–8)
Greater secondary coverts	10 (10–10)	8 (8–8)	8 (8–9)
Middle secondary coverts	9 (8–10)	7 (5–8)	8 (6–9)
Carpal remex	1 (1–1)	1 (0–1)	1 (0–1)
Patagial coverts	0 (0–1)	0 (—)	1 (0–3)
Alula	2 (0–2)	2 (2–2)	2 (2–2)
Total average	337	254	340

[a] From Wetherbee 1957: Table 4.
[b] Unpaired region on midline (all others paired).

The Black Phoebes had 230–266 neossoptiles present in 18–21 tracts or regions while the Say's Phoebes had 319–349 neossoptiles present in 21–22 tracts or regions (Table 1). The total average number of neossoptiles (total of the average feather count for each individual tract and region) was 254 for the Black Phoebe and 340 for the Say's Phoebe (Table 1). The total average number reported for the Eastern Phoebe was 337 (Wetherbee 1957: Table 4). Say's Phoebe had, on average, neossoptiles present in 22 tracts or regions, while Black and Eastern phoebes had neossoptiles only in 20. All specimens of all three species of *Sayornis* had two or fewer neossoptiles present in the superciliary region; only the Eastern Phoebe had downs present in the infraorbital region of the capital tract. Both of these regions were first described as passerine neossoptile pterylae by Wetherbee (1957:350) in his study of the

Eastern Phoebe; the tracts appear to have adventitious downs present only occasionally in the genus *Sayornis* and have not been reported as containing downs in other recent studies (Minsky and Collins 1983, Collins and McDaniel 1989). The auricular region is strongly invested with neossoptiles in all three species of *Sayornis* and a few postauricular downs characterize two of the three species in the genus. These regions were similarly first described as passerine neossoptile pterylae in the Eastern Phoebe.

The pattern of neossoptiles we found in the regions of the spinal tract does not strictly agree with Wetherbee's (1957) description of the Eastern Phoebe. All specimens of all three species had 5–15 downs in paired rows in the middorsal region of this tract. Similarly, all specimens had 1–9 downs in an unpaired medial row in the pelvic region. However, Wetherbee (1957:350) noted that in the Eastern Phoebe the "two most posterior neossoptiles [of this region] were offset laterally." Similar offset downs in Say's and Black phoebes were not strictly posteriorly located, and they were therefore considered as belonging to a paired row of lateral pelvic region downs found on either side of the medial pelvic row. These lateral downs are only sparsely represented in *Sayornis* and are easily mistaken as part of the medial pelvic row. The lateral pelvic rows are well developed in other species such as the House Finch (*Carpodacus mexicanus*) (Collins and Bender 1977a) and Red-capped Cardinal (*Paroaria gularis*) (Collins and Bender 1977b); this is the first report of their being present in the Tyrannidae. Some *Sayornis* specimens also had unpaired medial neossoptiles at the anterior end of the middorsal region. There were 3–6 neossoptiles in this row in both specimens of Say's Phoebe and one down in one specimen of the Black Phoebe. This anterior medial row has perhaps been overlooked by other workers or considered as an asymmetric anterior extension of one of the lateral middorsal rows of neossoptiles. Its partial overlap with the anterior-most paired middorsal elements in one Say's Phoebe specimen demonstrates that it represents a newly recognized, but distinct, unpaired medial row of passerine neossoptiles which we propose to call the interscapular region of the spinal tract. The spinal tract is now considered to consist of interscapular, middorsal, pelvic (medial), and lateral pelvic regions. The paired dorsal cervical neossoptiles, recorded thus far only in the Red-capped Cardinal (Collins and Bender 1977b), could also be considered a region of the spinal tract, but it should be studied in additional species.

In *Sayornis*, as noted by Clark (1967) in nestling Red-winged Blackbirds (*Agelaius phoeniceus*) and in the genus *Amphispiza* (Minsky and Collins 1983), those individuals having the greatest number of downs also tend to have them present in additional pterylae. Despite this and some interspecific differences, natal pterylosis seems to be similar overall in the genus *Sayornis*. Examination of additional specimens of both Black and Say's phoebes would probably reinforce the sense of this similarity. Strong intrageneric similarity was also noted in *Amphispiza* (Minsky and Collins 1983).

Within the Tyrannidae, *Sayornis* nestlings have appreciably more neossoptiles present than an array of closed-nest building species, many of which have only sparse or no natal down at hatching (Collins and McDaniel 1989, Collins 1990). On the other hand, chicks of other open-cup nesting flycatcher species, particularly those nesting in more open situations (e.g., *Elaenia*) may have more than 500–600 neossoptiles (Collins, unpubl. data). The position of *Sayornis* along this continuum is appropriate for species that build open-cup nests in covered-over situations. This is an ecological rather than a taxonomic correlation as noted earlier (Collins and McDaniel 1989). The natal pterylosis of additional species deserves further attention before taxonomic implications are drawn or discarded for either the Tyrannidae or other passerine families.

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An incidence of second brood production by an Eastern Wild Turkey.—Renesting after loss of an initial nest has been well documented for Wild Turkeys (*Meleagris gallopavo*) (Williams et al. 1976, 1980). Based on a sample of 123 hens in Florida, Williams and Austin (1988) reported 57% renesting for hens that had their nests disrupted during the laying period, 28% for hens whose nests were disrupted during incubation, and no renesting after incubating more than 18 days. Turkeys are not known to renest following loss of a brood, and reports of Wild Turkeys hatching two broods in one season have not been published (Williams 1981). This phenomenon has only recently been documented for the Northern Bobwhite (*Colinus virginianus*), a species of the same family (Phasianidae) (Sermons and Speake 1987). We describe here the hatching of two broods in one season by a free-ranging Eastern Wild Turkey (*M. gallopavo silvestris*).

These data were collected during a study conducted in Thomas and Grady counties, Georgia. For a detailed description of the study area see Sisson et al. (1990). Reproductive efforts of 26 Wild Turkey hens were monitored from 1 March 1988 to 31 July 1990. Turkeys were captured in late winter with alpha-chloralose treated corn (Williams 1966), leg banded, outfitted with solar-powered radio transmitters with motion switches (Everett et al. 1978),