

UNSUITABILITY OF TREE SWALLOWS AS HOSTS TO BROWN-HEADED COWBIRDS

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Abstract.—Swallows are parasitized rarely by Brown-headed Cowbirds (*Molothrus ater*). I added cowbird eggs to 15 Tree Swallow (*Tachycineta bicolor*) nests. One egg disappeared and seven failed to hatch whereas 63 of 66 host eggs hatched. The seven cowbird hatchlings died in 3–12 ($\bar{x} = 6.3$) d, whereas six of the seven swallow pairs each fledged the cowbird's four swallow nest-mates. The cowbirds grew more slowly than cowbird nestlings in naturally parasitized nests of typical hosts. Tree Swallows appear to be unsuitable cowbird hosts during both incubation and nestling periods.

TACHYGINETA BICOLOR HUESPED INAPROPIADO PARA MOLOTHRUS ATER

Resumen.—Rara vez las golondrinas son parasitadas por los tordos *Molothrus ater*. Yo coloqué huevos de tordo en 15 nidos de *Tachycineta bicolor*. Un huevo desapareció, siete no eclosionaron mientras que 63 de los 66 huevos del huesped eclosionaron. Siete pichones de tordo murieron en un periodo de 3–12 días ($\bar{x} = 6.3$) mientras que seis de las siete parejas de *Tachycineta bicolor* involucradas en los trasplantes de huevos pudieron criar sus respectivos pichones. Los tordos criados por *Tachycineta bicolor* crecieron más lentamente que cuando los mismos son criados por huéspedes típicos. *Tachycineta bicolor* aparenta ser un huesped inadecuado para *Molothrus ater* durante el periodo de incubación y de crianza de pichones.

The Brown-headed Cowbird (*Molothrus ater*) is a generalized brood parasite known to have parasitized over 200 species of birds (Welty 1982). Tree Swallows (*Tachycineta bicolor*), like all swallows, are rarely parasitized by cowbirds. Friedmann (1963) gives only one definite example, and, of 2511 cowbird nest records in the Ontario Nest Records Scheme, only one is from the 3624 Tree Swallow nest records (Peck 1979). Here I report the results of a field experiment testing the suitability of Tree Swallows as hosts of Brown-headed Cowbirds.

At Magnetawan, Ontario (45°40'N, 78°38'W) in 1986, I collected 15 cowbird eggs by the method described by Dufty (1983): female cowbirds trapped in the evening and housed in cages overnight were released the following morning after laying an egg. I parasitized 15 swallow nests on 18 May–4 Jun. Incubation periods typically last 11–12 d for cowbirds and 13–16 d for Tree Swallows (mean difference of 3 d) (Terres 1980). I deposited the eggs 2–4 ($\bar{x} = 3.4$) d after each swallow laid her penultimate egg (the day incubation was assumed to begin) and 0–4 ($\bar{x} = 1.5$) d after the cowbirds laid them.

One cowbird egg disappeared a day before the swallow clutch hatched. Of the remaining 14 nests, only seven hatched the cowbird egg (50%) whereas 63 of 66 swallow eggs hatched (95%). Four cowbird eggs hatched the same day as the first swallow egg, two hatched a day before and one hatched a day after. All hatched in 12 or 13 ($\bar{x} = 12.4$) d, slightly longer than the average for cowbirds. Likelihood of hatching and time between

the laying of the cowbird egg and deposition in the swallow's nest were unrelated (1.4 d for the hatched set and 1.6 d for the unhatched set; $t = 0.184$, $df = 12$, $P > 0.80$). The unhatched seven were in swallow clutches that took 15–19 ($\bar{x} = 17.0$) d to hatch, whereas the hatched seven were in clutches that took 15–17 ($\bar{x} = 15.7$) d to hatch ($t = 1.89$, $df = 12$, $P = 0.08$).

Where necessary, the seven parasitized broods that hatched cowbirds were immediately culled after hatching to contain four swallows and one cowbird. All seven cowbirds died within 3–12 d ($\bar{x} = 6.3 \pm 3.2$ [SD]), whereas six of the seven nests fledged the four swallow young. One complete brood died. The four swallow young with a cowbird nest-mate grew as fast as or faster than the young from seven other broods of five swallows. The cowbird nestlings averaged 8 ± 1.4 (SD) g ($n = 6$) on the fourth day and 18 ± 2.8 g ($n = 2$) on the eighth day while those raised in naturally parasitized nests of seven typical hosts (Friedmann 1929, Norris 1947, pers. obs.) averaged 15 ± 2.1 g ($n = 7$) on the fourth day and 28 ± 2.6 g ($n = 6$) on the eighth day. Cowbirds usually fledge within 11 d (Scott 1979). Tree Swallows usually fledge in about 20 d but reach adult weight within 11 d on average (Paynter 1954).

The reasons for the failure of the Tree Swallows as cowbird hosts are uncertain. The non-use of Tree Swallows by cowbirds in nature has usually been attributed to protection from parasitism because Tree Swallows are cavity nesters or to developmental incompatibility after fledging (Friedmann 1929, 1963). My data suggest other factors may be involved also.

Tree Swallows are sometimes off the eggs for prolonged periods during cold weather (Paynter 1954), allowing eggs even in later stages of incubation to become cold (pers. obs.). Cowbird eggs may be less cold-tolerant. Swallow young may also be more cold-tolerant and more tolerant of food shortages during those not infrequent periods when inclement weather makes aerial foraging difficult for the parent birds. Although my data do not address the issue, swallow young have bright yellow gapes that may be important releasers in dark nests; cowbird young have less intensely colored pink gapes.

Eastzer et al. (1980) reported high cowbird nestling survival in Barn Swallow (*Hirundo rustica*) nests artificially parasitized with eggs incubated in captivity for 9–10 d. Their criterion for success, however, was met when the cowbird nestling survived for 6 d, or half the nestling period. Twelve of their 18 nestlings (67%) survived to day six, but five of my seven nestlings (71%) survived more than 5 d. At least one of their cowbird nestlings fledged, whereas none of mine did.

Whether deposition of the cowbird egg earlier during the swallow laying period (giving the cowbird a 3 d advantage if it hatches) might increase survival of the cowbirds remains to be seen.

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NOTES AND NEWS

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