

TREE SWALLOWS RAISE BROWN-HEADED COWBIRD NESTLING

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ABSTRACT — Brown-headed Cowbirds (*Molothrus ater*) have been reported to parasitize Tree Swallows (*Tachycineta bicolor*) only a handful of times. Here I report the first record that Tree Swallows are capable of raising a cowbird nestling at a rate comparable to the developmental rate of successfully fledged parasitic nestlings in other host nests. This result is in contrast with the specific findings of Mills (1988) but supports his suggestion that cavity nesting alone may not explain the absence of cowbird parasitism of Tree Swallows.

INTRODUCTION

The Brown-headed Cowbird (*Molothrus ater*) is a generalist brood parasite, known to be raised successfully by over 140 species of birds in North America (Lowther 1993). A typical cowbird host is an open cup nesting small passerine that feeds an insect based diet to its young (Friedmann 1963, Lowther 1993). Even though they provide an insect based diet to their young (Friedmann 1963, Petit 1991), most common cavity nesting passerines (e.g. chickadees, swallows, etc.) are rarely parasitized by cowbirds.

Observations about cowbird parasitism of Tree Swallows (*Tachycineta bicolor*) have been reported only a handful of times (Friedmann 1963). Cavity nesting alone does not explain mechanistically the apparent lack of parasitism across the ranges of cowbirds and swallows because some Tree Swallow nests have indeed received cowbird eggs (Friedman 1963). In addition, standard size bluebird/swallow nest boxes do not prevent the cowbird's access to the nest: the opening of such a box is wide enough (~3.5 cm) to allow free passage for an adult female cowbird (personal observation). Finally, other cavity nesters, such as the Prothonotary Warbler (*Protonotaria citrea*), are frequently parasitized by cowbirds (Petit 1991), and Eastern Bluebirds (*Sialia sialis*) and Carolina Wrens (*Thryothorus ludovicianus*) are known to fledge cowbird nestlings successfully (Woodward 1983).

To investigate whether Tree Swallows could serve as hosts for cowbirds, Mills (1988) artificially parasitized 15 Tree Swallow nests. Because cowbirds had a relatively high survival rate in artificially parasitized nests of the closely related Barn Swallow (*Hirundo rustica*) (Eastzer and others 1980), Mills was surprised to find that none of seven cowbird hatchlings survived to fledging.

Here I report that Tree Swallows are capable of raising a nestling cowbird to fledging.

OBSERVATIONS

On 30 June 1997, a Cedar Waxwing (*Bombycilla cedrorum*, a rejecter species, *sensu* Rothstein 1976), was found incubating one cowbird and three waxwing eggs in a nest at the Cornell Experimental Ponds (CEP), Ithaca, NY. I removed the cowbird egg and within 20 minutes I placed it into an incubator (39°C, 70-80% humidity), as part of a hand raising study. On 3 July, by 09:00 EST the cowbird had hatched and I fed it a small amount of moistened puppy chow. It was then placed into a Tree Swallow nest box at the CEP swallow colony (Winkler 1993) and checked on a daily basis. The nest box was occupied by a second-year female and her mate, and it contained 4 eggs, which had been incubated for a about 11-12 days. This is similar to the incubation period of cowbird eggs in other host nests (Lowther 1993, personal observation). The cowbird nestling was accepted and apparently fed by the swallows, developing at a comparable rate to cowbird nestlings raised by other, common hosts of cowbirds (Figure 1). Only three of the four swallow eggs hatched, two on 5 July and one on 6 July (2 and 3 days after the cowbird, respectively), and the swallow nestlings' subsequent growth rate was similar to that of others at the CEP colony (P. Allen and D. Winkler, personal communication). The fourth egg remained clear with a large air sac and was probably infertile. On 14 July, when I opened the side panel of the nest box, the 11 day old cowbird was positioned near the front of the box and was trying to escape from my hand by jumping toward the opening of the box. I banded the cowbird nestling with a U.S. Fish and Wildlife Service and a color band. On 15 July, by 09:15 only three swallow nestlings were present in the box, suggesting that the cowbird fledged from the nest. I did not find any signs of the banded fledgling cowbird during the next two days in the study area and all food items on 11 subsequent feeding visits by the parent swallows in the proximity of the nest box on 15 July were delivered to the swallow nestlings remaining in the nest box.

DISCUSSION

The cowbird developed at a rate comparable to those raised by more typical cowbird hosts and it was likely to have fledged from the nest at 11 days of age. This is similar to the average fledgling age for cowbirds raised by other, common hosts (Lowther 1993). It was unlikely that the cowbird nestling was depredated or died while still in the swallow nest because the nest boxes in the study area are protected by conical metal aluminum sheets ("predator guards") and because neither were there any cowbird remains in or near the nest, nor were

the other nestlings injured or dead. Nonetheless, it is likely that once fledged, the cowbird did not survive because I did not see the host swallows feeding it.

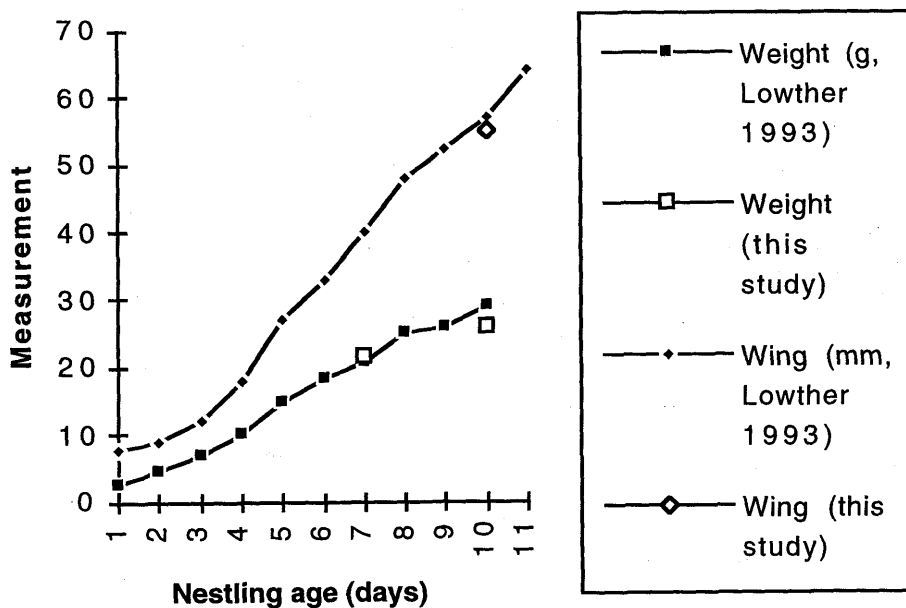


Figure 1. Comparisons of weight and flattened wing measurements of cowbird nestlings raised by common hosts (Lowther 1993) and Tree Swallows (this study).

The cowbird in this study was incubated and hatched outside the swallow nest and was placed into the nest box 2-3 days prior to the hatching of three Tree Swallow nest mates. It had also been fed a small amount of food by the observer prior to its placement into the nest box. These circumstances may have provided an advantage that the parasitic nestlings in the Mills (1988) study did not have because the latter were incubated by swallows and hatched only 0-1 day prior to their four host nest mates. Possibly weather conditions, which are known to have a great impact on swallow foraging and survival (McCarty 1995), were also more favorable in Ithaca in 1997 than those experienced by cowbirds in the Mills study in Ontario in 1988, although nestling mortality of cowbirds in Mills' study was not associated with weather related nestling mortality of swallows (Mills 1988). Furthermore, the observation that a cowbird can survive to

fledging in a Tree Swallow nest suggests that nutritional content of food and intrabrood competition, at least in the one nest that I studied, do not necessarily prohibit the development of the parasitic nestling in the nest of this potential host.

There could be several reasons why Brown-headed Cowbirds do not parasitize Tree Swallows. First, historically cowbirds and Tree Swallows were likely to occupy different habitats (Lowther 1993) and cowbirds may not have evolved to recognize Tree Swallows as potential hosts. Thus, previous records of female cowbirds investigating swallow boxes and parasitizing them are due to recognition errors. Alternatively, some cowbirds may recognize Tree Swallows as potential hosts but nest defense in swallow colonies (Winkler 1992) is so efficient that it keeps the parasites out of their nests. Finally, because of the costs of lowered hatching and fledging success (Mills 1988) and potentially lowered post-fledging survival (Friedmann 1963), cowbirds, which had laid their eggs in nests of Tree Swallows rather than in nests of other hosts, may have been selected against. To determine whether the lack of parasitism of Tree Swallows by cowbirds is adaptive for the parasite itself, further research should attempt to contrast the quality of Tree Swallows as hosts, integrated across the nest-searching, incubation, nestling, and fledgling stages of the parasite with similarly calculated indices of host quality of sympatric and frequently parasitized species.

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