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Wilson Bull., 100(1), 1988, pp. 126–128

Evidence of intraspecific brood parasitism in the Tree Swallow.—Intraspecific brood parasitism is of interest because it selects against the evolutionary maintenance of parental care and genetically rewards individuals who do not provide care (i.e., parasites) and genetically punishes those who do (i.e., hosts). In the best known examples (e.g., Evans 1980, Power et al. 1981, Brown 1984, Gowaty and Karlin 1984, Emlen and Wrege 1986) brood parasitism appears to be related to competition for access to a limited number of nest sites (see Yom-Tov 1980). Here I present evidence of intraspecific brood parasitism in a nest-site limited

species, the Tree Swallow (*Tachycineta bicolor*). Tree Swallows are nonexcavating cavity nesters.

From 1980 to 1983 I monitored 120 Tree Swallow nests at a nest-box trail on the salt marshes of the J. F. Kennedy Memorial Wildlife Refuge at Tobay Beach on the south shore of Long Island, New York (see Schaeffer 1972 for a description of the study site). Each nest was visited once each morning from the day the first egg was discovered until no new eggs had been laid for two days. Nests were usually visited after the normal laying period for the day. Each egg was numbered in sequence with an indelible marker.

At seven of 120 (5.8%) nests, two eggs appeared in less than 24 h. Kuerzi (1941) also reported two eggs appearing in less than 24 h at three of 68 (4.4%) Tree Swallow nests. The frequency I found, however, is likely an underestimate because parasitic eggs that were laid the day before host clutch initiation or the day after clutch completion were undetectable by my methods (cf. Frederick and Shields 1986a). Using Frederick and Shields (1986a) method of correcting for this underestimation produces a corrected estimate that 11 of 120 (9.2%) nests were parasitized. This frequency is similar to the frequencies of parasitized nests estimated for other passerines (e.g., Cliff Swallow [*Hirundo pyrrhonota*], 0–25% depending on colony size, Brown 1984; Eastern Bluebird [*Sialia sialis*], 15%, Gowaty and Karlin 1984; European Starling [*Sturnus vulgaris*], 11–37%, Evans 1980, Power et al., unpubl. data; White-fronted Bee-eater [*Merops bullockoides*], 10–27% depending on colony, Emlen and Wrege 1986), but greater than the frequency of 1.5% estimated by Frederick and Shields (1986b) for the White Ibis (*Eudocimus albus*). However, it is much lower than the frequencies reported for some species of duck (Anatidae) (e.g., Weller 1959, Morse and Wright 1969, Clawson et al. 1979, McCamant and Bolen 1979) where one-half to two thirds of nests are sometimes parasitized.

At another eight of 120 (6.7%) nests, eggs disappeared from clutches during egg laying. None of these eggs appeared damaged before they disappeared. (Tree Swallows often remove damaged eggs from their nests [pers. obs.].) Egg removal may be evidence of intraspecific brood parasitism because egg removal appears to be an important tactic in the brood parasitism strategies of other species (e.g., Brown 1984; Emlen and Wrege 1986; Lombardo et al., unpubl. ms.). More study is needed, however, to determine whether Tree Swallow brood parasites remove host eggs before replacing them with their own.

Acknowledgments.—I thank J. R. Crook, P. C. Frederick, H. W. Power, and L. C. Romagnano for their comments on the manuscript. The Town of Oyster Bay, New York, kindly allowed me to use the Kennedy Refuge as a study site. Financial support was provided by a BRSG Grant to H. W. Power from Rutgers University and from grants from the F. M. Chapman Fund, the Northeastern Bird Banding Association, Sigma Xi, the J. Leatham Fund of the Zoology Department, and the Ecology Graduate Program of Rutgers University.

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Wilson Bull., 100(1), 1988, pp. 128–130

Nest-construction tactics in the Cedar Waxwing.—Nest construction involves a large expenditure of time and energy (Collias and Collias 1984). Putnam (1949) estimated that building a nest would require a pair of Cedar Waxwings (*Bombycilla cedrorum*) to make over 2500 trips. In addition to the cost of transporting material to the nest site, observations of the struggles of birds to break off twigs or pull fibers loose, and the frequent failures involved, suggest that nest building is an energetically expensive activity. Nonetheless, it seems that little attention has been paid to the tactics that birds might use to reduce the costs associated with nest construction. Collias and Collias (1984) suggested that energy costs may be reduced considerably if good sources of nest materials are located close to the nest site. Skutch (1976) suggested that birds may save labor by removing material from other nests, either deserted or occupied, and gives examples of such behavior in several tropical and colonially nesting species.

During a study of the breeding biology of the Cedar Waxwing at the Prince Edward Point National Wildlife Area, near Picton, Ontario, we made a number of observations of waxwings engaging in activities that could substantially reduce the large expenditure of time and energy required for nest building. These involved taking material from either old nests or active nests of other birds, and reusing abandoned nests of conspecifics.

On several occasions we observed waxwings taking material from old nests of Cedar Waxwings and other species. The main drawback to gathering material from old nests is likely to be the possibility of acquiring ectoparasites from the material. Putnam (1949) reported two cases of Cedar Waxwings deserting nests infested with mites, and in both