NEW RECORD OF COWBIRD EGG BURIAL IN BLUE-HEADED VIREO NEST

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ABSTRACT

Yellow Warblers *(Dendroica petechia)* sometimes bury Brown-headed Cowbird *(Molothrus ater)* eggs laid in their nests under a new nest or rarely under only a new nest lining. Buried eggs do not hatch because they cannot be properly incubated. Thus, cowbird egg burial removes the cost of parasitism. Burial of cowbird eggs by host species other than the Yellow Warbler is uncommon and little is known about the adaptive significance of this behavior. Here we present details of the fifth observation of cowbird egg burial by Blue-headed Vireos *(Vireo solitarius).* A single cowbird egg, laid before the vireo initiated her clutch, was buried in the lining of the nest. Two additional cowbird eggs and three vireo eggs laid in the completed nest were not buried. The first cowbird egg apparently was laid prematurely and was buried when the adults continued building the nest. In this instance, cowbird egg burial likely was not an anti-parasite defense.

INTRODUCTION

Egg burial is a defense strategy used by Yellow Warblers to rid themselves of the cost of Brown-headed Cowbird parasitism (Sealy 1995). Yellow Warblers bury cowbird eggs laid in their nests by constructing a new nest (i.e., base, frame, and lining) or rarely only a new nest lining on top of the cowbird egg(s) and any of their own eggs in the original nest (Mico 1998). Buried eggs have no contact with the brood patch of an incubating bird and cannot be properly incubated, which results in hatching failure. Thus, cowbird egg burial (hereafter burial) removes the reproductive cost of raising cowbird young.

Several observational and experimental studies have examined burial behavior in Yellow Warblers (Clark and Robertson 1981, Burgham and Picman 1989, Weatherhead 1989, Sealy 1995, Mico 1998, Sealy and Lorenzana 1998). However, little is known about burial in other host species, such as Blue-headed Vireos. A literature review found 109 burial records for 45 species of passerines (Mico 1998). These records often lack details of the nesting event or the observer removed all or some of the cowbird eggs. Additional detailed records of burial in species other than Yellow Warblers may help elucidate the adaptive significance of this behavior.

Friedmann (1929, 1963) summarized three observations of cowbird egg burial by Blue-headed Vireos (Friedmann 1929) and Solitary Vireos *(V. solitarius)* (Friedmann 1963). James (1998) reports an additional record from the Ontario nest records scheme. The taxonomic status of the Blue-headed Vireo has changed several times since Friedmann's first compilation in 1929. It was considered a distinct species by the American Ornithologists' Union (AOU) in 1931, but subsequently was treated as a subspecies of the Solitary Vireo *(V.s. solitarius)* (AOU 1957, 1983). Recently, the Solitary Vireo was split into three species: Plumbeous Vireo *(V. plumbeus),* Cassin's Vireo *(V. cassinii),* and Blue-headed Vireo (AOU 1997). The geographic locations of existing records of egg burial from Massachusetts (Greene 1892), New York (Allen 1913), West Virginia (Dickey 1941), and Ontario (James 1998), identifies the Blue-headed Vireo as the species considered here based on its current range (AOU 1998). To our knowledge, these are the only published records of cowbird egg burial in this species. Here, we report details of a fifth observation of burial by Blue-headed Vireos in Tompkins Co., NY.

METHODS

The observations reported below were made during a large scale nest monitoring project on six 80 ha forested study sites in Tompkins Co. and Schuyler Co., NY. Sites were located in the Finger Lakes National Forest (2 sites), Connecticut Hill Wildlife Management Area (3 sites), and in Cornell University's Arnot Forest (1 site). From 1992 to 1997, sites were searched for nests of all species of birds breeding from May through August. Nests were monitored usually every 2 to 4 days until fledging or nest failure.

OBSERVATIONS

On 8 May 1997, Underwood found a pair of Blue-headed Vireos building a nest 4.6 m high in an Eastern Hemlock *(Tsuga canadensis)* with-

in the Connecticut Hill Wildlife Management area. The nest cup was not yet fully formed. On 15 May, inspection of the nest revealed a cowbird egg only partly visible because it was covered by nest lining. Subsequent visits found a final clutch of 3 vireo and 2 more cowbird eggs, but the laying sequence of these eggs was not known. None of these eggs was buried. Both cowbird eggs and two vireo eggs eventually hatched between 31 May and 4 June. By 12 June, no vireo nestlings were evident, and only 2 cowbird nestlings remained in the nest. One nestling prematurely fledged when the nest contents were inspected. On the last nest check, on 16 June, the second cowbird had fledged and could be heard begging nearby. One unhatched vireo egg was left in the nest. An additional visit was made to the nest to measure vegetation parameters. The vireo nest was examined closely and a small, exposed pocket was found in the nest lining containing a small cowbird eggshell fragment, thus confirming the earlier observation of a buried cowbird egg. No other eggs were buried and the pocket appeared only big enough for one egg. This observation of burial was the only instance from 6 parasitized Blue-headed Vireo nests found on all study sites from 1992 to 1997.

DISCUSSION

Rothstein (1975) questioned whether egg burial by Yellow Warblers was a response to parasitism and suggested that host eggs must be buried along with cowbird eggs for it to function as an anti-parasite strategy. Several studies have since shown that Yellow Warbler eggs are often buried along with cowbird eggs (Sealy 1995 and references therein). In addition, burial by Yellow Warblers was found to involve the construction of an entirely new nest (base, frame, and lining) on top of the eggs in their old nest (Mico 1998). Therefore, burial by Yellow Warblers appears to function as an anti-parasite strategy, although the exact stimulus the warblers use to detect parasitism is unknown (Sealy and Lorenzana 1998).

In our observation, burial by Blue-headed Vireos did not appear to function as an anti-parasite strategy. The buried cowbird egg was laid before any vireo eggs and probably before the nest was finished. A close inspection of the vireo nest after the young fledged revealed the empty pocket where the cowbird egg was buried. This pocket appeared to be formed within the nest lining and the nest did not look extraordinarily thick or larger than other Blue-headed Vireo nests without buried eggs in them (Underwood pers. obs.). In addition, the cowbird eggs that were laid in the nest after the burial of the first cowbird egg were not buried. However, the laying sequence of these eggs was not known and the cowbird eggs could have been laid late in or after the vireo's laying stage.

Yellow Warblers have been shown to bury significantly fewer cowbird eggs that have been laid later in their own egg laying stage (Clark and Robertson 1981, Sealy 1995). In this instance of egg burial, the cowbird egg was buried as the adult most likely completed the construction of the nest after the cowbird egg was laid, and not as a reaction to the cowbird egg itself.

Burial by Blue-headed Vireos appears to be a rare event. In this study, only one burial was recorded out of 6 parasitized nests and only four other records of burial have been published in over a century. Unfortunately, there has been no intensive study of the interactions between Blue-headed Vireos and cowbirds. Further research is needed to clarify the role of egg burial and other potential anti-parasite defenses in Blue-headed Vireos.

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