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American Coot Parasitism on Least Bitterns

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ABSTRACT.—American Coots (*Fulica americana*) are known for laying eggs in the nests of conspecifics, but there is little evidence that they regularly parasitize the nests of other species. I found 13 Least Bittern (*Ixobrychus exilis*) nests, 2 of which were parasitized by coots. These are the first records of coots parasitizing Least Bitterns, and the first records of any form of brood parasitism on Least Bitterns. Nests of Least Bitterns also were parasitized experimentally with a variety of nonmimetic eggs and 27% were rejected (n = 11 nests). This indicates that Least Bitterns may possess some egg recognition abilities. *Received 15 August 2005, accepted 21 March 2006.*

Facultative avian brood parasites build nests and raise their own young, but they also lay eggs in the nests of conspecifics (conspecific brood parasitism; CBP) and sometimes in the nests of other species (interspecific brood parasitism; IBP). CBP has been documented in at least 236 bird species (Yom-Tov 2001) and appears to be relatively common in colonial birds, waterfowl, and cavity-nesters (MacWhirter 1989, Rohwer and Freeman 1989, Yom-Tov 2001). One of the best-studied conspecific brood parasites is the American Coot (*Fulica americana*; Arnold 1987; Lyon 1993a, 1993b, 2003). CBP appears to be a relatively common reproductive strategy among coots. For example, Lyon (1993a) found that 13% of all coot eggs over a 4-year period were laid parasitically and more than 40% of nests were parasitized by conspecifics. The parasites are females with nesting territories that lay parasitically prior to laying eggs in their own nests, and floater females that are unable to acquire nesting territories of their own (Lyon 1993a).

On rare occasions, coots have been known to lay eggs in the nests of other species. To date, three host species have been recorded: Franklin's Gull, (*Larus pipixcan*; Burger and Gochfeld 1994), and Cinnamon Teal (*Anas cyanoptera*) and Redhead (*Aythya americana*) (Joyner 1973). It is unknown whether any of these cases of parasitism were successful, although coot chicks are dependent on their par-

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TABLE 1. Responses of Least Bitterns to natural and experimental brood parasitism in Warren County, Iowa, 2003–2004.

Nest	Host's clutch size when parasitized	Nesting stage when parasitized	Egg type added	Accepted or rejected
03–3	5	Incubation	Plaster cowbird egg	Rejected
03–16	5	Incubation	Least Bittern egg colored black	Accepted
03–18	6	Unknown	Two naturally laid coot eggs	Accepted?[a]
03–19	6	Incubation	Wooden egg colored black	Rejected
03–20	3	Laying	Least Bittern egg colored black	Accepted
03–22	4	Unknown	One naturally laid coot egg	Accepted
03–31	5	Laying	One coot egg placed in the nest	Accepted
03–32	6	Incubation	Wooden egg colored black	Accepted
03–34	6	Incubation	One coot egg placed in the nest	Accepted
04–49	2	Laying	One coot egg placed in the nest	Accepted
04–55	4	Incubation	Wooden egg colored black	Rejected

[a] One of two coot eggs disappeared from this nest along with two Least Bittern eggs.

ents for food and typically perish without their assistance (Brisbin et al. 2002); thus, it is unlikely that these instances of parasitism were successful (B. E. Lyon pers. comm.). I report the first records of American Coot parasitism on Least Bitterns (*Ixobrychus exilis*). I also experimentally parasitized Least Bittern nests to determine whether bitterns possess defenses, such as egg rejection, against parasitism.

METHODS

This study was conducted in a restored wetland in Warren County, Iowa, just north of Indianola (41° 4′ N, 93° 6′ W), in 2003 and 2004. The dominant vegetation consisted of cattails (*Typha* spp.) and willows (*Salix* spp.), and water depth was <1.5 m. Nests of Least Bitterns, American Coots, Pied-billed Grebes (*Podilymbus podiceps*), and passerines such as Great-tailed Grackles (*Quiscalus mexicanus*), Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*), Red-winged Blackbirds (*Agelaius phoeniceus*), and Marsh Wrens (*Cistothorus palustris*) were monitored every 1–3 days.

I also experimentally parasitized Least Bittern nests with a variety of egg types during laying and incubation to determine their responses to parasitism. These eggs included (1) the Least Bittern's own eggs (31 × 24 mm; Baicich and Harrison 1997) colored black with permanent-ink markers to make them nonmimetic, (2) real coot eggs (49 × 34 mm; Baicich and Harrison 1997), (3) wooden eggs colored black (34 × 22 mm), and (4) plaster eggs (21 × 16 mm) made to look like those of the Brown-headed Cowbird (*Molothrus ater*; Table 1). The latter two egg types have been used in similar egg-recognition experiments (Rothstein 1975, Peer and Bollinger 1998, Peer and Sealy 2001). Only one egg type was added to each nest. Experimentally parasitized nests were checked every 1–3 days to determine the responses of Least Bitterns. Eggs were considered rejected if they were missing from the nest after it was parasitized.

RESULTS

Coots parasitized 18.2% (n = 11) of Least Bittern nests in 2003 and no nests (n = 3) in 2004. The first parasitized nest contained six bittern eggs and two coot eggs when found. Four bittern eggs hatched, and two bittern eggs and one coot egg disappeared. The second parasitized bittern nest was found containing four young bitterns and a coot egg that never hatched. Both parasitized nests were located near the water level, whereas the unparasitized bittern nests were at least 30–60 cm above the water level. Seven Pied-billed Grebe nests, 15 coot nests, and 1 unidentified duck nest also were monitored, but there was no evidence of parasitism on these nests.

The single artificial cowbird egg that was added to a bittern nest was rejected the following day, as were two of three black wooden eggs (10 and 13 days; Table 1). None of the colored bittern eggs was rejected (n = 2) and only one coot egg may have been rejected

within 8 days after it was found (n = 5; Table 1).

DISCUSSION

These are the first reported instances of American Coot parasitism on Least Bitterns (see Gibbs et al. 1992) and the first record of any form of brood parasitism on Least Bitterns. The Least Bittern is likely an unsuitable host for the coot because the bittern's incubation period is 17–20 days (Gibbs et al. 1992) and the coot's is 23–27 days (Brisbin et al. 2002); thus, any coot eggs laid in bittern nests would not have sufficient time to develop and hatch. Indeed, two of the parasitic coot eggs did not hatch and the fate of the third egg was unclear (see discussion below). It is also unlikely that a coot would be fed properly or receive adequate parental care from a Least Bittern, in which case it would probably die if the egg did hatch (Brisbin et al. 2002).

Why would coots lay their eggs in a potentially unsuitable host's nest? It is possible that the coot eggs I observed were laid by floater females (B. E. Lyon pers. comm.), as floater females are unable to obtain their own nesting territories and presumably attempt to make the best of a bad situation by practicing CBP (Lyon 1993a). Such females may be unable to locate and successfully parasitize other coots and are forced to parasitize the nests of unsuitable hosts (e.g., bitterns). Interestingly, the two parasitized nests that I observed were very near water level—similar to the floating platform nests used by coots. The coots that parasitized the bittern nests, or other coots in the population, also may have been practicing CBP. Lyon (1993a) found that the reproductive success of floater females was only 6% of that of nesting females, and only 3.6% of parasitic eggs produced by floaters produced young. The reasons for the lower reproductive success of floaters were the anti-parasite behavior of hosts (rejected 38% of floater eggs) and the timing of laying: floaters tended to lay late in the host's nesting cycle (Lyon 1993a). CBP in general is not a very successful strategy among coots, as only 7.7% of all parasitic eggs produced young that survived (Lyon 1993b); however, territorial females can increase their reproductive success by laying eggs in the nests of neighbors. Brood reduction is common in coots; thus, by laying eggs in the nests of conspecifics, they maximize their reproductive success (Lyon 1993a).

Least Bitterns rejected some of the foreign eggs placed into their nests. One of the naturally laid coot eggs disappeared from a nest, but it is unclear whether this was due to rejection, partial predation, or the coot chick hatching and leaving the nest. Bitterns rejected two of three wooden eggs and the artificial cowbird egg. The latter may have been so small that the bitterns viewed it as debris and removed it from the nest; however, the wooden eggs were approximately the same size as the bittern eggs, indicating that bitterns may possess some recognition abilities. Bitterns did not remove any of their own, colored eggs or any coot eggs. Egg recognition in this species deserves further study.

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Brown-headed Cowbird's Fatal Attempt to Parasitize a Carolina Chickadee Nest

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ABSTRACT.—On 5 June 2003, a female Brown-headed Cowbird (*Molothrus ater*) was found dead in a Carolina Chickadee (*Poecile carolinensis*) cavity nest near Bucyrus in Crawford County, Ohio. The cowbird had little room in the cavity and likely could not remove itself after laying an egg. Carolina Chickadee nests are rarely parasitized by brood parasites, and the size of their cavity entrances likely limits parasitism by Brown-headed Cowbirds. This is the first known instance of a Brown-headed Cowbird mortality after laying an egg in the cavity nest of a host species. *Received 6 September 2005, accepted 21 March 2006.*

More than 220 avian species reportedly have been parasitized by Brown-headed Cowbirds (*Molothrus ater*; Lowther 1993). Whereas the Carolina Chickadee (*Poecile carolinensis*) is an uncommon host species, there are a few records of Brown-headed Cowbirds parasitizing that species (Friedmann 1938, Goertz 1977). The closely related Black-capped Chickadee (*P. atricapillus*) also has been parasitized, and individuals have been observed feeding Brown-headed Cowbird fledglings (Lowther 1983). Such observations suggest that these chickadee species are capable of raising the young of Brown-headed Cowbirds, but that some mechanism may be limiting Brown-headed Cowbirds from taking advantage of these potential host species more often. Cavity nesting seems to offer some protection from brood parasites, as cavity nesters have been found to have low levels of parasitism (Strausberger and Ashley 1997). Female Carolina Chickadees cover their eggs during the egg-laying stage (Brewer 1961), which also may offer protection against parasitism. Studies have revealed lower levels of parasitism among some host species because they reject cowbird eggs (Strausberger and Ashley 1997) or because they do not provide adequate nutrition to cowbird young (Mills 1988).

During 2003, we monitored a pair of color-banded Carolina Chickadees nesting in natural cavities in a 2.63-ha woodlot located in Crawford County, Ohio (40° 46′ N, 82° 58′ W). The landscape is dominated by agriculture, with woodlots scattered throughout the county. On 5 June 2003, we discovered a Carolina Chickadee nest cavity from which most of a dead female Brown-headed Cowbird's tail was protruding. The cowbird appeared to have died only a day or two before we found the nest and appeared cramped in the cavity. The cavity entrance dimensions were 38 mm high × 42 mm wide, similar to average dimensions previously reported for Carolina Chickadee cavity entrances (Brewer 1961, Albano 1992, Mostrom et al. 2002). The cavity was 155 mm deep, and the nest was made with grass, hair, feathers, and plant down. We did not measure the female cowbird, but her size appeared to be normal. Inspection of the nest confirmed that the cowbird had laid one egg, but we found no chickadee eggs in the nest. Given the depth of the nest cavity, we can only as-

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