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## UNUSUAL PARASITISM BY THE BRONZED COWBIRD<sup>1</sup>

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We report four unusual incidences of brood parasitism by the Bronzed Cowbird (*Molothrus aeneus*) in south Texas during July 1993 and June–July 1994: (1) the first reported use of the Yellow-billed Cuckoo (*Coccyzus americanus*) as a host; (2) the first reported use of the Western Kingbird (*Tyrannus verticalis*) as a host; (3) the second reported raising of Bronzed Cowbirds to fledging age by a Couch's Kingbird (*Tyrannus couchii*), a known rejector of cowbird eggs; and (4) a record number of parasitic eggs laid in a single host's nest and still incubated by the host, in this case a Green Jay (*Cyanocorax yncas*).

The Bronzed Cowbird is a generalist brood parasite, known to parasitize nearly 80 species of birds (Friedmann 1929, 1963, 1971; Friedmann et al. 1977; Carter 1984). Bronzed Cowbirds range from Colombia into the extreme southwestern United States, and are common in the Lower Rio Grande Valley region of southern Texas, particularly in the Santa Ana National Wildlife Refuge (SANWR). As part of a larger study of Bronzed Cowbird social behavior (E.D.C.) and a breeding bird study (T.B.) in the SANWR, we examined host nests whenever they were found and made observations of parental behavior.

Although the Yellow-billed Cuckoo is common in the Lower Rio Grande Valley, there are no records of brood parasitism of this species by Bronzed Cowbirds (Friedmann 1929, 1963; Friedmann et al. 1977; Carter 1986). This lack of records is surprising because Yellow-billed Cuckoos are known to be occasional hosts of Brown-headed Cowbirds (*Molothrus ater*; Friedmann 1971), and because they are relatively large-bodied (28–33 cm long) and insectivorous, two characteristics common to many Bronzed Cowbird hosts. There is no evidence that Yellow-billed Cuckoos reject Bronzed Cowbird eggs, either by ejection or by desertion (Carter 1986; Clotfelter, unpubl. data). On 7 June 1994, we found a cuckoo nest in the SANWR, one that previously contained three cuckoo eggs, with one cuckoo egg and one Bronzed Cowbird egg. Both eggs were punctured, presumably by a Bronzed Cowbird. This is consistent with Carter's (1986) observation that Bronzed Cowbirds puncture both host eggs and other cowbird eggs. Brown-headed Cowbirds are not known to puncture host eggs (Scott et al. 1992). On 12 July 1994, we found another nest in the SANWR containing only one punctured cuckoo egg, also presumably punctured by a Bronzed Cowbird.

Bronzed Cowbirds have approximately 11-day nestling periods, typical for a brood parasite (Payne 1977, Carter 1986). Yellow-billed Cuckoos, however, have accelerated nestling periods for their body size (9–11 days; Nolan and Thompson 1975, Potter 1980). As most brood parasites select hosts with developmental periods longer than their own (Payne 1977), it is unlikely that Bronzed Cowbirds can successfully fledge from cuckoo nests. It is possible that parasitism and

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egg-puncturing by Bronzed Cowbirds of Yellow-billed Cuckoo nests increases the frequency of nest abandonment, contributing to the wide decline of this species.

On 9 July 1993, two Western Kingbirds were observed feeding two Bronzed Cowbird fledglings in a residential area in Edinburg, Hidalgo County, Texas (approximately 50 km north of the SANWR). Although Western Kingbirds are rare hosts of the Brown-headed Cowbird, no records exist of parasitism by Bronzed Cowbirds (Friedmann and Kiff 1985). Like cowbirds, the Western Kingbird has adjusted well to human disturbance and has undergone a dramatic range expansion in the western and midwestern United States (MacKenzie and Sealy 1981). This species most likely has been overlooked as a Bronzed Cowbird host because it is uncommon in the Lower Rio Grande Valley (Oberholser 1974), where the majority of Bronzed Cowbird research has been conducted (e.g., Carter 1984, 1986). Like many other Bronzed Cowbird hosts, these kingbirds are also relatively large (20 cm long) and insectivorous. It is not known if Western Kingbirds eject cowbird eggs, as do two of their congeners, the Eastern Kingbird (*Tyrannus tyrannus*; Rothstein 1975) and the Couch's Kingbird (*Tyrannus couchii*; Carter 1986).

On 17 July 1994, a Couch's Kingbird was observed feeding two Bronzed Cowbird fledglings in the SANWR. A few previous records exist of Bronzed Cowbird eggs laid in nests of this species (Friedmann 1963, Carter 1986), and on one occasion a cowbird was successfully fledged (Carter 1986). These observations are significant because they indicate that rejector species like Couch's Kingbird may be parasitized and even suffer reduced reproductive success. The fact that Bronzed Cowbirds can develop in Couch's Kingbirds' nests suggests that they may have been a more commonly used host in the past, but that due to strong selective pressure they have evolved anti-parasite strategies such as egg discrimination and ejection.

In June 1994, we found two Green Jay nests containing unusually large numbers of Bronzed Cowbird eggs. The first nest (found 11 June) contained 11 cowbird and two Green Jay eggs. The female Green Jay incubated the nest long past the normal incubation time (17–18 days; Alvarez 1975) and abandoned the nest on 10 July with all eggs still unhatched. The second nest (found 20 June) contained nine Bronzed Cowbird eggs and two Green Jay eggs. This female incubated normally, and three nestling cowbirds hatched before it was depredated on 10 July. The largest recorded number of Bronzed Cowbird eggs laid in a "dump" nest (not incubated by the host) is 14, and the largest number laid in an active nest is 10 (Friedmann et al. 1977, Carter 1984). Neither of these reported nests hatched cowbird nestlings. Carter (1986) reported that active nests from six major host species (including Green Jays) averaged  $2.2 \pm 1.9$  Bronzed Cowbird eggs per nest ( $n = 98$  nests, range = 0–7 eggs). Thus, the first Green Jay nest is significant in that it represents the largest number of parasitic eggs reported in an active nest for any of the five parasitic cowbirds (genera *Molothrus*, *Scaphidura*). The second nest represents the largest clutch of cowbird eggs known to have hatched viable young.

As a whole, these observations point out the limits

in our understanding of the parasitic behavior of the Bronzed Cowbird. With future study, additional host species will undoubtedly be discovered, and relationships with known host species will become better understood. Understanding the process of host selection and host/parasite relationships will become increasingly important as Bronzed Cowbirds expand their range in the United States and encounter naive host species (Robbins and Easterla 1981).

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