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NOTA

Frequent parasitism of Golden-winged Caciques (*Cacicus chrysopterus*) by Shiny Cowbirds (*Molothrus bonariensis*) in the Chaco region of Argentina and Paraguay

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RESUMO: Parasitismo frequente do vira-bosta (*Molothrus bonariensis*) em ninhos do tecelão (*Cacicus chrysopterus*) na região do Chaco da Argentina e do Paraguai. Evidência de parasitismo pela primeira espécie foi detectada em todos os estágios do ciclo reprodutivo do hospedeiro, desde o período de construção do ninho até a saída dos filhotes. Obtivemos 14 registros de parasitismo de *M. bonariensis* após a saída do ninho, todos envolvendo *C. chrysopterus,* que alimentavam um filhote do parasito, mesmo na ausência de filhotes do hospedeiro. Na região do Chaco, *C. chrysopterus* parece ser um dos mais importantes hospedeiros efetivos de *M. bonariensis.*

PALABRAS-CHAVE: *Molothrus bonariensis, Cacicus chrysopterus,* parasitismo, Chaco.

KEY-WORDS: *Molothrus bonariensis, Cacicus chrysopterus,* brood parasitism.

Most reports of brood parasitism on caciques have involved the Giant Cowbird (*Molothrus oryzivorus*) as the parasite, and the Red-rumped (*Cacicus haemorhous*) and Yellow-rumped (*C. cela*) caciques as hosts (*e.g.* Goeldi 1897, Friedmann 1963, Haverschmidt 1968, Fleischer and Smith 1992). These two cacique species nest in conspicuous colonies (Feekes 1981, Jaramillo and Burke 1999). By contrast, the few reports of brood parasitism on the non-colonial nesting caciques (Friedmann and Kiff 1985, Lowther and Post 1999) indicate brood parasitism by the Shiny Cowbird (*M. bonariensis*). The smaller Shiny Cowbird is a generalist and abundant parasite, with 200 + known hosts throughout South America and the Caribbean (Friedmann and Kiff 1985, Lowther and Post 1999); many of its hosts are also icterids (Fraga 2002).

The Golden-winged Cacique (*Cacicus chrysopterus*) was first reported as a Shiny Cowbird host in Santa Catarina, southern Brazil (Friedmann and Kiff 1985). The first reports from Argentina were obtained from Santa Fe province (De la Peña 1987). Di Giacomo (2005) presented considerable information from a single locality (Reserva El Bagual, Formosa province). Further information on brood parasitism is not available from other localities in Argentina, or from Paraguay. Besides the relative paucity of data, there is little published evidence that Golden-winged Caciques are effective hosts (*i.e.* able to rear Shiny Cowbird chicks). Here we review the Argentinean information on this host-parasite system, and present new data from northern Argentina and Paraguay confirming that Golden-winged Caciques are frequently parasitized by Shiny Cowbirds, and indicating their role as important effective hosts in the Chaco region.

Data were obtained independently by both authors during ornithological surveys and inventories. The first author made most of his observations at Parque Nacional Chaco, Chaco province, Argentina (26°48'S/59°36'W) between February 1997 and January 2002. This national park comprises several types of mesic to humid subtropical savanna and forest, mostly along the upper watershed of the Río Negro, a tributary of the Paraná river. Supplementary data were obtained at Parque Provincial Pampa del Indio, also in Chaco province (26°03'S/59°55'W). The vegetation at this locality includes mesic to xeric forest, but also thorn woodland and scrub. The second author reports observations obtained in patches of humid forest near the Laguna Iberá, Reserva Provincial del Iberá, Corrientes province, Argentina (28°32'S/57°11'W). Data were also gathered during a 17 km boat trip along the Río

Confuso, a tributary of the Paraguay River, Departamento Presidente Hayes, Paraguay (25°03'S/57°36'W), on 18 January 2003. The Confuso has a narrow gallery forest and flows along humid savannas and pastures with groves of the palm *Copernicia alba.* We obtained coordinates of nests using a GPS.

As we made observations in protected areas, and most nests were inaccessible to us, we checked the contents of only seven nests found near the reserves. Nests were found with eggs ("egg stage") or with at least one chick ("nestling stage"), host or parasite. We observed cacique and cowbird behavior with 8 × 30 binoculars, and their voices were tape recorded with shotgun microphones. Shiny Cowbird fledglings were detected mostly by their loud, distinctive and persistent begging calls (Fraga 1998). Cacique chicks differ from cowbird chicks in plumage, body proportions and vocal behavior (*pers. obs.*).

The host species is a small cacique with a mean body mass of 41.3 g, (males) and 31.7 g (females) (data from Argentina and Paraguay, Contreras 1983). Shiny Cowbirds in northern Argentina have a larger body mass, with means of 55.7 g (males) and 44.9 g (females) (Mason 1980, Fraga 1998). Golden-winged Caciques live in varied habitats, from humid subtropical forest (Atlantic forests of eastern Brazil, and montane forests in the Andean slopes), to the more open and xeric Chaco woodland (Jaramillo and Burke 1999, *pers. obs.*). Host and parasite seem to be broadly sympatric (Jaramillo and Burke 1999).

Golden-winged Caciques are solitary nesters, but sometimes one or two older nests (exceptionally four) maybe clustered near the new structure, even along the same branch, but the older structures are not used. Twice we saw new nests attached to the bottom of old ones. In Argentina Golden-winged Caciques were seen or heard almost daily at Parque Nacional Chaco and at Reserva Provincial Pampa del Indio. In riparian forest along the 17 km of the Río Confuso (Paraguay), eight nests or nest clusters were located at distances ranging from 0.9 to 1.4 km, giving some idea of the linear density of this icterid.

Nests containing cacique eggs were found from 22 October to 8 January. Other sources indicate that Golden-winged Caciques in Argentina lay eggs from October to December (De la Peña 1987, Di Giacomo 2005). The egg-laying season of Shiny Cowbirds in northern Argentina extend from October to the end of February (Hoy and Ottow 1964, Salvador 1984, Fraga 1998). We observed about 120 cacique nests in Argentina and Paraguay: all were long purses (45-60 cm) opening at the top, The main or exclusive material were blackish rhizomorphs of the fungus *Marasmius,* as reported in the literature (Wright and Ferraro 1985, Sick 1993, Di Giacomo 2005). The structure is attached to a single isolated branch tip, and suspended in an open space 2 to 7 m above ground level, frequently over streams or temporary rainpools. The dark nests were relatively inconspicuous if located under the dense shade of a tree, but visible if exposed to sunlight among the surrounding green vegetation. The songs and displays of the nesting caciques made the nests more conspicuous.

During the nest-building stage Shiny Cowbirds visited two nearly finished cacique nests at Reserva Iberá (25 and 26 September 1998). One nest was visited twice during 5 continuous hours of observation, in both cases by single female cowbirds, although in one case a male cowbird escorted the female 20-30 m away. The female cowbirds perched about 1 m above the nests, uttering chatter calls on two occasions. The caciques were absent during both visits.

We found five nests during the egg stage, all from Parque Nacional Chaco, of which three contained Shiny Cowbird eggs. The cacique eggs were white with brownish spots, with mean dimensions (maximum length and width) of 24.8 × 16.5 mm. The egg dimension are similar to those reported by De la Peña (1987). Shiny Cowbird eggs in our sample were quite variable in coloration and marking. Regardless of color, the parasite eggs were more rounded and thicker shelled than those of the cacique host, with mean dimensions of 24.2 × 19.4 mm.

De la Peña (1987) reported parasitism on three of four cacique nests found in the egg stage. When both samples are combined the incidence of parasitism was 67% (six of nine nests). Di Giacomo (2005) found parasitism in 63 of 117 nests examined (53.8%), but he apparently included nests found during the egg and chick stages. We found only one cowbird egg per parasitized nest, but De la Peña (1987) found one to four (mean = 2), and Di Giacomo (2005) reported one to nine (no mean given).

Di Giacomo (2005) did not report host clutch size in parasitized nests, but stated that the cacique lays three to four eggs. Combining the nests in De la Peña (1987) with ours, the host clutch size in the three non-parasitized nests ranged from 2 to 4, with a mean of 3 eggs. Host clutch size in the six parasitized nests ranged from 1 to 3, with a mean of 2.5 eggs. The sample is small, but suggestive of a negative effect of parasitism on host clutch size, as documented for many Shiny Cowbird hosts (*e.g.* Fraga 1985). Shiny Cowbirds may have removed or damaged cacique eggs, causing this negative effect.

We found two nests in the nestling stage. One nest was not parasitized, containing three well-feathered cacique chicks. The other was parasitized, containing a feathered cowbird chick (about 10 days old), and no host chicks. We presume that in this case the host eggs were destroyed by the cowbirds. Alternatively, as Shiny Cowbird eggs hatch in 11-12 days (Fraga 1985), versus 14 days for the cacique (Di Giacomo 2005), the parasite may have hatched first and out-competed any remaining host

nestlings. Our postfledging records of parasitism were obtained in Parque Nacional Chaco (n = 11), Parque Provincial Pampa del Indio (n = 2) in Argentina, and along the Río Confuso, Paraguay (n = 1). Observation dates covered the period from 25 November to 18 January. In all the cases (n = 14) caciques were attending single cowbird chicks, again suggesting that host eggs or chicks in parasitized nests often fail to survive. As the vocalizations and plumage of fledgling caciques are conspicuous and distinctive (*pers. obs.* of 11 non-parasitized broods from Misiones, Argentina), our data suggests a low survival chance of host chicks in parasitized broods.

In Parque Nacional Chaco the Golden-winged Cacique was the species most frequently observed rearing Shiny Cowbird fledglings. Our data suggest that Shiny Cowbirds may considerably reduce the nesting success of the caciques in the Chaco region of South America, as defined by Cabrera and Willink (1973), and Hueck (1978). Our data from Misiones suggests a lower incidence and effect of parasitism in areas with dense forest cover (Atlantic forest, the Yungas) where the cowbird may be rare or absent.

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