

SHORT COMMUNICATIONS

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EVIDENCES OF BROOD PARASITISM OF GIANT COWBIRD (*MOLOTHRUS ORYZIVORUS*) ON SPOT-BREADED (*ICTERUS PECTORALIS*) AND STREAK-BACKED (*I. PUSTULATUS*) ORIOLES

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Parasitismo de cría del Tordo gigante (*Molothrus oryzivorus*) sobre el Bolsero maculado (*Icterus pectoralis*) y el Bolsero dorsilistado (*I. pustulatus*).

Key words: Brood parasitism, fitness, Giant Cowbird, Nicaragua, *Molothrus oryzivorus*, Spot-breasted Oriole, *Icterus pectoralis*, Streak-backed Oriole, *Icterus pustulatus*.

Giant Cowbirds (*Molothrus oryzivorus*) are obligate brood parasites specializing on colonial sock-nesting icterids (Orians 1985, Jaramillo & Burke 1999). Two subspecies are recognized, *M. o. oryzivora* and *M. o. impacifica*. The former occurs in South America and ranges north into Panama and the island of Trinidad; the latter ranges from western Panama north to the Caribbean coast of Mexico and north to Veracruz (Jaramillo & Burke 1999). Apart from a single obscure record of Giant Cowbird parasitism of nests of cooperative-breeding Green Jays (*Cyanocorax yncas*) (Lehmann 1960), they are known only to place their eggs in the nests of two species of caciques and five species of oropendolas: Yellow-rumped Cacique (*Cacicus cela*), Red-rumped Cacique (*C. haemorrhous*), Crested Oropendola (*Psarocolius decumanus*), Green Oropendola (*P. viridis*), Russet-backed Oropendola (*P. angustifrons*),

Chestnut-headed Oropendola (*P. nagleri*), and Montezuma Oropendola (*P. montezuma*) (Orians 1985, Robinson 1988, Fleischer & Smith 1992, Nava Solorio 1994, Jaramillo & Burke 1999).

No records to date, however, demonstrate brood parasitism of the Giant Cowbird on any solitary territorial nesting species, and they have not been considered among candidate species for this event (Lowther 2006). Here we report on observations made using field glasses indicating that solitary, territorial-nesting Spot-breasted Oriole (*Icterus pectoralis*) and Streak-backed Oriole (*I. pustulatus*) also serve as hosts of the Giant Cowbird. Nesting habitat was broken tropical dry forest with areas of secondary growth reaching to 15 m alternating with yards of single-family homes in a rural area on the edge of the Chiltepe Peninsula Nature Reserve, Nicaragua. This

preserve is located on a peninsula that penetrates Lake Managua, about 20 km north of the capital of Managua. Rainfall averages under 800 mm yearly, with almost all rainfall concentrated between May and November.

The Spot-breasted Oriole inhabits closed forest and areas with sparse tree cover in tropical dry forest from SW Mexico to NW Costa Rica. It has been documented breeding from May through July in pendulous nests woven from fine fibrous materials up to 45 cm depth, hanging from the fork of a fine branch 6 to 18 m high (Stiles & Skutch 1989). The female builds the nest and incubates the eggs (Orians 1985). The number of eggs is reported as 3–4 (Jaramillo & Burke 1999). Both sexes feed the nestlings. This species is reported double-brooded in some locales with the male caring for the first brood while the female begins incubating the second. The Streak-backed Oriole occupies a similar range and habitat to the Spot-breasted Oriole, and the two species are often found nesting in nearby trees. Nesting has been documented from 3 to 18 m in height in nests from 25 to 50 cm in depth, with 3–4 eggs, during May through June (Stiles & Skutch 1989, Corman & Monson 1995). Nest construction is accomplished only by the female and takes about 25 days. The female alone incubates. The incubation and nestling period appear similar to those of other orioles, taking 12–14 days for incubation and about 14 days for fledging (Corman & Monson 1995). Both sexes feed the nestlings. Both the Spot-breasted and the Streak-backed orioles have been reported as possible acceptors of Bronzed Cowbird (*M. aeneus*) parasitism (Sealy *et al.* 1997, Sealy & Underwood 2004).

On 4 September 1999, we observed both male and female adult Spot-breasted Orioles feeding a Giant Cowbird fledgling on the Chiltepe Peninsula, near Lake Xiloá (12°12.754'N, 86°19.000'W; 59 m a.s.l.). Feeding activities by both adult orioles were

observed on each of the next 4 days for 2–5 h each day. The area has an incomplete canopy cover in residential yards and secondary growth in nearby fields. The fledgling made begging calls incessantly during all of our observations, and the orioles fed it arthropods at intervals averaging 4 min. The orioles brought arthropods to the fledgling from distances > 80 m. The fledgling remained at 8–12 m height in *Phyllostylon brasiliensis* (Ulmaceae) and flew occasionally from tree to tree. A recently built sock-shaped nest, approximately 40 cm deep at approximately 10 m height, was 60 m from the point at which the cowbird fledgling was first sighted, but we could not confirm whether the nest was used by the orioles feeding the cowbird fledgling. There was no evidence of an oriole fledgling within 300 m radius of the cowbird fledgling. The orioles apparently were no longer attending their nest and were not feeding any other fledgling; they appeared to be dedicated entirely to feeding the single cowbird fledgling.

Beginning on 14 August 2002, we observed a Giant Cowbird fledgling being fed by two adult Streak-backed Orioles on the Chiltepe Peninsula (12°12.868'N, 86°18.889'W; 72 m a.s.l.). The vegetation structure was similar to that in the prior, nearby sighting. As in the prior case, the Giant Cowbird fledgling made begging calls ceaselessly and was continuously fed by two adult orioles. Residents of the yard next to this sighting claimed that the fledgling had fledged about 1 week earlier from a nest in their yard, a pendulous sock about 1 m in length placed approximately 10 m in height, and had remained in the vicinity, associated with the adult orioles, during the entire time. We made another observation at the same site on 19 August 2002, when both adult orioles fed the fledgling for 3 h. On this date, the fledgling occasionally dropped to the ground to eat fruits of *Chlorophora tinctoria* (Moraceae).

Giant Cowbirds have also been reported to eat the fruit of two other moraceous species, *Ficus trigona* and *Coussapoa* (Robinson 1988). We observed the fledgling and orioles again on 20 August for >1 h. As the orioles moved from tree to tree, the cowbird fledgling followed them while being fed. The orioles moved >100 m on each foray to retrieve food for the fledgling, and we repeatedly lost contact with the pair. We did not find any evidence of care by the adults for oriole fledglings during this period of sightings. Skutch (1996) speculated that this common observation was likely due to 1) the observer missing the host feeding its own young, 2) cowbird fledglings being more conspicuous, or 3) cowbird fledglings quickly outcompeting host young after fledging. We believe that the latter is the best explanation for our observations. Our last observation of the Giant Cowbird fledgling was on 23 August 2002 during which time the oriole adults did not appear after more than 1 h, in spite of repeated calling by the fledgling, which made locating it easy. The fledgling moved from tree to tree within a radius of 40 m and on several occasions, dropped to the ground to feed. We did not observe any oriole fledglings in the area (100 m radius) during the entire period of these observations.

Giant Cowbird fledglings were much larger than the orioles and were distinguishable from them and from other cowbirds by their reddish feet, ivory bill, and easily discernable whitish margins on black flight feathers. We considered it very unlikely that these fledglings were hatched in a known host nest and were being fed by a species that did not rear the cowbird in its nest, as none of the previously documented hosts of Giant Cowbirds were found in the area (Sealy *et al.* 1997, Lowther 2006). Furthermore, most auxiliary feedings of fledgling brood parasites have been reported in the cuckoos and the Brown-headed Cowbird (*M. ater*) (Sealy & Lorenzana

1997). Although the natural range of Montezuma Oropendola, the most typical host species in the region, included the Chiltepe Peninsula, they were not present within at least 10 km of this location (JKM unpubl.), possibly due to habitat alterations from clearing pasture land and cutting fuelwood. Giant Cowbirds commonly parasitized Montezuma Oropendola nests in Laguna de Apoyo, some 60 km southeast of Chiltepe Peninsula, where nesting begins at the start of the dry season in December (JKM unpublished data); the parasitism of oriole broods, where nesting occurs later in the year, would permit more reproductive cycles by Giant Cowbirds and potentially higher productivity. Giant Cowbirds are strong flyers and can easily move between the Chiltepe Peninsula and Laguna de Apoyo, or other sites, to deposit eggs for breeding in alternate seasons.

The question has been raised whether Giant Cowbird brood parasitism of oropendolas is parasitism or mutualism (Webster 1994). In studies of their parasitism of oropendola nests, elaborate hypotheses of hyperparasitism and a blurring of the boundary between parasitism and mutualism (Smith 1968, 1983) have been developed regarding the complex associations between the Giant Cowbird, its brood host species, wasps and bees, and parasitic botflies (*Philornis* spp.). In the smaller, solitary territorial *Icterus* spp., our observations suggest that parasitism by the Giant Cowbird may profoundly affect oriole brood success and fitness, given the observed concentrated efforts at feeding cowbird fledglings and the absence of host species fledglings in both our observations. In addition to the Spot-breasted and the Streak-backed orioles, the Altamira Oriole (*I. gularis*), which is slightly larger, also nests in the Chiltepe Peninsula, and two Neotropical migrants, the Baltimore Oriole (*I. galbula*) and the Orchard Oriole (*I. spurius*), overwinter in this area. The Altamira Oriole has similar nesting habits to

the other two orioles; its nest is similar but intermediate in form between the other two orioles and the oropendolas. The high feeding rate of Giant Cowbird fledglings by the orioles and the lack of oriole fledglings in our observation suggest that Giant Cowbirds may be extremely detrimental to the fitness of nesting oriole species.

It has been noted that conservation efforts should focus on those species most vulnerable to parasitism, i.e., species that accept parasitism (Sealy & Underwood 2004). The distribution, ecology, and conservation status of the resident orioles in Nicaragua are little known, although the Spot-breasted Oriole has been previously identified as in need of conservation due to its low abundance and limited overall geographic range (Gillespie 2000). Based on our reported evidence of brood parasitism of these species by Giant Cowbirds, increased attention to their conservation status may be warranted on the Pacific slope of Nicaragua.

The evidence we present demonstrates that Giant Cowbirds parasitize solitary territorial nesting species where colonial sock-nesting birds are not present, and suggests that oriole nests may be parasitized and that surrogate parental orioles may spend considerable quantities of energy in chick feeding. These results have implications in potential Giant Cowbird habitat and in oriole conservation.

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REFERENCES

- Corman, T., & G. Monson. 1995. First United States nesting records of the Streak-backed Oriole. *Western Birds* 26: 49–53.
- Fleischer, R. C., & N. G. Smith. 1992. Giant Cowbird eggs in the nests of two icterid hosts: the use of morphology and electrophoretic variants to identify individuals and species. *Condor* 94: 572–578.
- Gillespie, T. W. 2000. Rarity and conservation of forest birds in the tropical dry forest region of Central America. *Biol. Conserv.* 96: 161–168.
- Jaramillo, A., & P. Burke. 1999. *New World blackbirds: the icterids*. Princeton Univ. Press, Princeton, New Jersey.
- Lehmann, F. C. 1960. *Contribuciones al estudio de fauna de Colombia*. Noved. Colomb. 1: 275–276.
- Lowther, P. E. 2006. List of victims and hosts of the parasitic cowbirds (*Molothrus*). The Field Museum, Chicago, Illinois. <http://fm1.fieldmuseum.org/aa/Files/lowther/CBLList.pdf>
- Nava Solorio, J. 1994. Breeding habits of the Montezuma Oropendola (*Psarocolius montezuma*) at Bacalar, Quintana Roo, Mexico. *An. Inst. Biol. Univ. Nac. Autón. Mex. Ser. Zool.* 65: 265–274.
- Orians, G. H. 1985. *Blackbirds of the Americas*. Univ. of Washington Press, Seattle, Washington.
- Robinson, S. K. 1988. Foraging ecology and host relationships of Giant Cowbird in southeastern Peru. *Wilson Bull.* 100: 224–235.
- Sealy, S. G., & J. C. Lorenzana. 1997. Feeding of nestling and fledgling brood parasites by individuals other than the foster parents: a review. *Can. J. Zool.* 75: 1730–1752.
- Sealy, S. G., J. E. Sánchez, R. G. Campos R., & M. Marin. 1997. Bronzed Cowbird hosts: new records, trends in host use, and cost of parasitism. *Ornitol. Neotrop.* 8: 175–184.
- Sealy, S. G., & T. J. Underwood. 2004. Acceptors and rejectors of cowbird parasitism in the New

- World orioles (*Icterus* spp.). *Ornitol. Neotrop.* 15: 331–347.
- Skutch, A. F. 1996. Orioles, blackbirds, and their kin: a natural history. Univ. of Arizona Press, Tucson, Arizona.
- Smith, N. G. 1968. The advantage of being parasitized. *Nature* 219: 690–694.
- Smith, N. G. 1983. *Zarhynchus magleri* (Oropendola cabelicaña, Oropendola, Chestnut-headed Oropendola). Pp. 614–616 in Janzen, D. H. (ed.). *Costa Rican natural history*. Univ. of Chicago Press, Chicago, Illinois.
- Stiles, F. G., & A. F. Skutch. 1989. *A guide to the birds of Costa Rica*. Comstock Publishing Associates, Inc., Cornell Univ. Press, New York.
- Webster, M. S. 1994. Interspecific brood parasitism of Montezuma Oropendolas by Giant Cowbirds: parasitism or mutualism? *Condor* 96: 794–798.

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