

ORNITHOLOGIA NEOTROPICAL 13: 301–305, 2002
 © The Neotropical Ornithological Society

FIRST OBSERVATIONS ON THE NESTING BEHAVIOR OF THE COLOMBIAN MOUNTAIN-GRACKLE (*MACROAGELAIUS SUBALARIS*), A PROBABLE COOPERATIVE BREEDER

Carlos Daniel Cadena¹, Christian Devenish² & Natalia Silva³

¹Department of Biology & International Center for Tropical Ecology, University of Missouri-St. Louis, 8001 Natural Bridge Road, St. Louis, MO 63121-4499, U.S.A.
E-mail: cdc0b1@admiral.umsl.edu

²Fundación Redes, Calle 95 # 17-76 Oficina 602, Bogotá, Colombia.

³Departamento de Ciencias Biológicas, Universidad de los Andes, Apartado Aéreo 4976, Bogotá, Colombia.

Primeras observaciones sobre el comportamiento de anidación y posible cría cooperativa en *Macroagelaius subalaris*.

Key words: Andes, Colombia, Colombian Mountain-Grackle, cooperative breeding, Icteridae, *Macroagelaius subalaris*, nesting behavior.

INTRODUCTION

The Colombian Mountain-Grackle (*Macroagelaius subalaris*) is a poorly known forest icterid endemic to the northern part of the eastern Andes of Colombia (Hilty & Brown 1986). Although it used to be a common and relatively widespread species within its limited range, it has experienced a severe population decline as a result of deforestation over recent years and is now threatened with extinction (Jaramillo & Burke 1999). The Colombian Mountain-Grackle is suspected to be extinct or at least extremely rare in areas where it was common c. 30 years ago (see Olivares 1969) and is now critically endangered according to IUCN criteria (BirdLife International 2000). Few observations have been made in the last decades, all of them taking place in remote forested areas in the department of

Santander. Despite its conservation status and because of its rarity and localized distribution, virtually nothing is known about the species' ecology and natural history (Jaramillo & Burke 1999). Here we present some observations that constitute the first data on the nesting behavior of the Colombian Mountain-Grackle and suggest that this species is likely to breed cooperatively. Detailed accounts of the song, calls, and behavior of the species will be published elsewhere (López-Lanus *et al.* in prep).

STUDY SITE

Our observations were made at Cachalú Nature Reserve, located in the municipality of Encino, department of Santander, on the western (Magdalena Valley) slope of the Eastern Andes of Colombia (06°04'N, 73°07'W).

The reserve, owned and administered by Fundación Natura Colombia, protects c. 1200 ha of primary and secondary montane forests (1800–2600 m a.s.l.) that adjoin Guanentá – Alto Río Fonce Fauna and Flora Sanctuary, a 10,430 ha protected area administered by the Colombian National Park System.

This region should be regarded as one of the most important areas for the conservation of threatened Colombian endemic birds. In addition to the Colombian Mountain-Grackle, it supports the only remaining populations known of the critically endangered Gorged Wood-quail (*Odontophorus strophium*), and thriving populations of the little known and endangered Black Inca (*Coeligena prunellei*). Other restricted-range species of the eastern Andes endemic bird area (*sensu* Stattersfield *et al.* 1998) occurring in the region include the endangered Rusty-faced Parrot (*Hapalopsittaca amazónica*), and low-concern Short-tailed Emerald (*Chlorostilbon poortmani*) and Moustached Brush-finches (*Atlapetes albifrenatus*) (Fundación Natura, unpubl. data, C. D. Cadena *et al.* pers. observ.).

RESULTS

On 22 June 2001, we observed from close range a group of four Colombian Mountain-Grackles in the upper levels of primary forest at 2150 m a.s.l.. The birds were notably vocal and responded aggressively to playbacks of their recorded vocalizations. One individual (possibly an adult male) was especially aggressive, approaching to within 5 m and singing persistently for over 10 min. We located a nest under construction on 24 June by observing birds carrying nest materials in their bills. The nest was placed on a fork on a branch c. 3 m below the crown of an emergent, living tree generally free from epiphytes apart from a few bromeliads. It was located on a steep slope facing a c. 5 m wide dry stream course, c. 15–20 m above the ground

at 2160 m a.s.l.. Judging by the size of the structure at that time and by the frequency with which materials were being added, nest building had likely begun a few days before. Four birds (probably the same individuals we had observed previously in the same general area) actively participated in nest construction. There were no noticeable differences in plumage or body size among the birds in the group. Nest materials included 5–30 cm long flexible plant fibers, twigs, and dry bromeliad and palm leaves, often obtained from trees located within 100 m of the nest site. All four birds in the group brought materials to the nest, but we never observed more than two individuals working on it at the same time. Upon returning to the nesting tree, they would usually take turns depositing materials at the nest before leaving as a group, usually after one of the birds vocalized. Only rarely did a grackle return alone to the nest. On 24 and 25 June, the group visited the nest frequently (mostly during the early morning), at 30–60 min intervals; visits were relatively short, ranging from a few seconds to c. 3 min. The birds' activity at the nest gradually diminished thereafter. Visits were much less frequent on 26 June and 30 June, the birds were only heard vocalizing close to the nest but didn't visit it on 4 July, and they were not found in the area at all after 7 July, suggesting that due to undetermined reasons the nest was abandoned before egg laying. Thus, we were unable to obtain information on clutch size and incubating and fledgling periods. When the nest was abandoned, it appeared to be very close to completion. This was also indicated by the fact that the birds mostly concentrated on working on the nest lining during the last days we observed them. The nest was a loosely woven cup, which we estimated to be c. 30 cm in diameter and c. 10 cm in height, based on the size of the birds. Because the nest was inaccessible, we were unable to photograph it or examine it from

close range.

Other bird species in the area were breeding at this time as well. We found active nests of Andean Cock-of-the-Rock (*Rupicola peruviana*), Slate-throated Redstart (*Myioborus minatus*), and Black-billed Thrush (*Turdus ignobilis*), and observed recently fledged juveniles of Moustached Puffbird (*Malacoptila mystacalis*), Orange-bellied Euphonia (*Euphonia xanthogastra*), and Chestnut-capped Brush-finches (*Buarremon brunneinucha*). Also, collected specimens of Chestnut-capped Brush-finches and Three-striped Warbler (*Basileuterus tristriatus*) had very enlarged gonads.

DISCUSSION

There is no previously published information on breeding for the Colombian Mountain-Grackle, other than that five specimens in breeding condition were collected in the department of Norte de Santander in September (Hilty & Brown 1986). Specimens housed in the collection of the Instituto de Ciencias Naturales (Bogotá) include one male with enlarged testes from Santander taken in March, four (both sexes) with small gonads from Cundinamarca taken in June, and one male with slightly enlarged testes taken in Cundinamarca in August (F. G. Stiles pers. com.). Our finding of nesting birds in June suggests that the breeding season of the species might extend over several months, and/or that there is little synchrony between areas or years. Reproduction in the Andes of Colombia usually peaks at the onset of the rainy season (around April and May) but extends through most of the first semester of the year, with some species breeding almost year-round.

The description of the only nest of the Tepui Mountain-Grackle (*M. imthurni*) found so far, a bulky cup with a messy overall appearance (Jaramillo & Burke 1999), matches our observations for the Colombian

Mountain-Grackle. However, although these two taxa have sometimes been considered conspecific, they differ in that in the Tepui Mountain-Grackle only one bird (a female) participated in nest building, and in the Colombian Mountain-Grackle we observed several individuals working together. Due to the small sample sizes available, however, we hesitate to interpret this as a biologically meaningful difference between the two taxa.

Although the nest was abandoned before egg laying, we find it reasonable to assume that the helping birds would not only cooperate in nest building, but would also help care the offspring. Thus, we believe that the evidence suggests the Colombian Mountain-Grackle is likely to have a cooperative breeding system (*sensu* Brown 1987). Cooperative breeding has been reported in six species of icterids (reviewed by Brown 1987, see also Ochoa & Cuervo 1998), and it has been suggested it should be looked for in two more (Jaramillo & Burke 1999). Leaving aside the Bobolink (*Dolichonyx oryzivorus*), a species in a monotypic genus of uncertain systematic position, cooperative breeding appears to occur only in the grackles and allies, one of the five icterid lineages identified by Lanyon & Omland (1999). Interestingly, all the species in the group that are known or suspected to be cooperative breeders occur in tropical or subtropical South America, a pattern which agrees with the idea that this behavior is favored in more stable and benign environments such as those in the tropics, but not in temperate areas that are subject to dramatic seasonal changes (Brown 1987). However, since North and South American species form two distinct, well-supported monophyletic groups (Johnson & Lanyon 1999), additional comparative studies involving other taxa are necessary to determine if cooperative breeding can be considered an adaptation to tropical environments (see Edwards & Naeem 1993) because different grackle spe-

cies within each region are not phylogenetically independent.

With the available data on nesting behavior and phylogeny, the most parsimonious hypothesis would be that cooperative breeding behavior evolved independently several times from a non-helper ancestor in the South American grackle lineage. However, the possibility that the ancestor of all South American species was a cooperative breeder cannot be ruled out at this moment due to the incomplete knowledge of the natural history of many of these species (see Jaramillo & Burke 1999). Presumed non-cooperative behavior in several South American species may just reflect incomplete knowledge and not a true characteristic of their breeding systems. Although the overall rarity of cooperative breeding in birds led to the idea that this behavior evolved from pair breeding, recent studies have demonstrated that in several groups, cooperative breeding is the ancestral condition from which pair breeding evolved (reviewed by Edwards & Naeem 1993, Ligon 1999; see also Nicholls *et al.* 2000, Saunders & Edwards 2000). Whether this situation applies to the Neotropical grackles remains an unsolved question that will only be amenable to rigorous examination when more basic natural history studies are completed.

ACKNOWLEDGMENTS

We are very grateful to Fundación Natura Colombia for allowing us to visit Cachalú and for providing invaluable logistic support; special thanks are due to Carolina Roa, José M. Martínez, and Ilma Madero. This manuscript benefited from comments by Robert Beason, Scott Lanyon, Bette Loiselle, and F. Gary Stiles and from discussions with Lúcia Lohmann. We thank Diana Bernal for help with field observations. Observations by CDC and CD were made while conducting other research supported by the International Cen-

ter for Tropical Ecology at the University of Missouri-St. Louis (Development Board Scholarship), the Organization for Tropical Studies (Donald and Beverly Stone Fund), The Explorer's Club (Exploration Fund Grant), and Idea Wild.

REFERENCES

- BirdLife International. 2000. Threatened birds of the world. Lynx Edicions, Barcelona, Spain.
- Brown, J. L. 1987. Helping and communal breeding in birds. Princeton Univ. Press, Princeton, New Jersey.
- Edwards, S. V., & S. Naeem. 1993. The phylogenetic component of cooperative breeding in perching birds. *Am. Nat.* 141: 754–789.
- Hilty, S. L., & W. L. Brown. 1986. A guide to the birds of Colombia. Princeton Univ. Press, Princeton, New Jersey.
- Jaramillo, A., & P. Burke. 1999. New World blackbirds: the icterids. Princeton Univ. Press, Princeton, New Jersey.
- Johnson, K. P., & S. M. Lanyon. 1999. Molecular systematics of the grackles and allies, and the effect of additional sequence (Cyt B and ND2). *Auk* 116: 759–768.
- Lanyon, S. M., & K. E. Omland. 1999. A molecular phylogeny of the blackbirds (Icteridae): five lineages revealed by cytochrome-B sequence data. *Auk* 116: 629–639.
- Ligon, J. D. 1999. The evolution of avian breeding systems. Oxford Univ. Press, Oxford.
- Nicholls, J. A., M. C. Double, D. M. Rowell, & R. D. Magrath. 2000. The evolution of cooperative and pair breeding in thornbills *Acanthiza* (Pardalotidae). *J. Avian Biol.* 31: 165–176.
- Ochoa, J. M., & A. M. Cuervo. 1998. Apuntes sobre la anidación del Cacique Candela *Hopothyrus pyrohypogaster*, en el municipio de Barbosa, Antioquia. *Bol. Soc. Antioq. Ornitol.* 9: 61–68.
- Olivares, A. 1969. Aves de Cundinamarca. Univ. Nacional de Colombia, Dirección de Divulgación Cultural Publicaciones, Bogotá, Colombia.
- Saunders, M. A., & S. V. Edwards. 2000. Dynamics and phylogenetic implications of mtDNA con-

SHORT COMMUNICATIONS

- trol region sequences in New World jays (Aves: Corvidae). *J. Mol. Evol.* 51: 97–109.
- Stattersfield, A. J., M. J. Crosby, A. J. Long, & D. C. Wege. 1998. Endemic bird areas of the world: priorities for biodiversity conservation. BirdLife International (Conservation Series No. 7), Cambridge, UK.

Accepted 11 December 2001.

