Received:25-November-2024 | Accepted: 30-April-2025 | Published: 19-May-2025

10.53157/ecotropicos.eqnb-9jdx

ECOLOGICAL NOTE

Description of a Crested Oropendola (*Psarocolius decumanus*) communal roost in Venezuela

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Funding
N/A

Academic editor:
Sabina A. Caula Q.

ABSTRACT

Communal roosting sites are important for understanding social interactions and population dynamics of gregarious animals. While roosting behavior has been well studied in North American blackbirds (Icteridae), less is known about Neotropical colonial species, particularly outside breeding seasons. This study aims to characterize a roosting site of Crested Oropendolas (*Psarocolius decumanus*) during the non-breeding season in northern Venezuela. During one day of observations, we recorded the abundance, sex ratios, and arrival times of oropendola flocks to the one roosting site, as well as the presence of other roosting species. Seven flocks making up to 287 Crested Oropendolas arrived in the evening, with a sex ratio of 3.5 females per male, contrasting with previous breeding season observations of female:male ratios (6:1 to 8:1). We also documented the presence of several Giant Cowbirds (*Molothrus oryzivorus*), an oropendola brood parasite. Our observations suggest that individuals from multiple nesting colonies share the same roost, given that most colonies count with less than a dozen adult birds in the Venezuelan Central Coast. Future research is needed to explore seasonal variation in the abundance and composition of roosts and their role in shaping social interactions and population processes of oropendolas and other Neotropical gregarious species.

Keywords:
Colonial birds, Icteridae, mixed-species roost, Neotropics, social behavior

Communal roosts are aggregations of animals that rest together (Bijleveld *et al.*, 2010), with roosting being reported in invertebrates as well as vertebrates, such as mammals and birds (Eiserer, 1984; Ansorge *et al.*, 1992; Lewis, 1995; Grether & Donaldson, 2007; Finkbeiner *et al.*, 2012). In particular, avian roosts have been suggested as information centers, where individuals acquire information about food resources, potential mates, or predation risks (Bijleveld *et al.*, 2010; Ward & Zahavi, 1973). Although these ideas are still debated (Richner & Heeb, 1996), roosting sites are key to study intraspecific and interspecific biotic interactions occuring among gregarious and social animals.

How to cite this article: Fernandes AM, Pérez-Emán, J, & Machado-Stredel, F. 2025. Description of a Crested Oropendola (*Psarocolius decumanus*) communal roost in Venezuela. Ecotrópicos. 36: e0023. https://doi.org/10.53157/ecotropicos.eqnb-9jdx

Several species of North American blackbirds (Icteridae) form monospecific and mixed-species roosts across seasons (Meanley, 1965; Dolbeer *et al.*, 1978; Caccamise & Fischl, 1985; White *et al.*, 1985). Studies of communal roosts can offer insights into the ecology and behavior of understudied species, especially in the Neotropics (see Lindell & Bosque, 1999). In particular, caciques and oropendolas (Cacicinae), include species with perhaps the highest female-biased sex ratios among icterids; some oropendolas having estimated mean ratios of 13 females per male (i.e., *Psarocolius decumanus*, *P. montezuma*; Webster 1992). Oropendolas (*Psarocolius*) roost communally every night and are conspicuous colonial nesters, with most caciques (*Cacicus* and *Cassiculus*) exhibiting similar nesting and roosting behaviors (Wetmore *et al.*, 1984; Jaramillo & Burke, 1999; Fraga, 2011; Guaitarilla *et al.*, 2021).

Most recent studies of oropendolas have been done around their nesting colonies (Fraga, 1989; Webster, 1994; Rodríguez-Ferraro, 2006; Fraga & Kreft, 2007; Aispuro, 2012; Krauczuk *et al.*, 2017; Machado-Stredel *et al.*, 2019, 2021), where low-ranking males and immatures are seen less frequently. Additionally, the composition of oropendola roosts and colonies likely changes between breeding and non-breeding seasons (Jaramillo & Burke; see also Meanley 1965). As such, oropendola roosting sites might constitute places where key social interactions occur between individuals of different nesting colonies. In this work, we characterize a Crested Oropendola (*P. decumanus*) roost in coastal Venezuela during the non-breeding season (August–December) and report the observed sex ratio of arriving flocks, along with the presence of other species roosting with or in proximity to Crested Oropendolas.

During the evening of November 7th, 2018, a Crested Oropendola roost was incidentally found on the grounds of Club Puerto Azul, Naiguatá, La Guaira (10° 37' 10.8" N – 66° 44' 38.1" W), on the Venezuelan Central Coast (Fig. 1). This private property, with limited access, has an extension of 350,000 m^2 approximately, in which ca. 40,000 m^2 are semi-open gardens formed by grass, bamboo, palms (*Roystonea oleracea*, *Cocos nucifera*), and other large trees (*Terminalia catappa*, *Swietenia macrophylla*, *Hura crepitans*). The roosting site consisted of a ca. 150 m^2 bamboo cluster, 100 m away from the coastal shore (Fig. 1), but on this occasion we were unable to estimate the number of Crested Oropendolas. The roost was located 3 km and 10 km away from two nesting colonies, that we previously found as part of an undergoing monitoring project focused mostly on urban Crested Oropendolas in Caracas, Venezuela (Machado-Stredel *et al.*, 2019, 2021). The site's location matches previous observations by Schäfer (1957) at Henri Pittier National Park, who estimated a distance of 2–3 km between bamboo roosts and Crested Oropendola colonies.

On November 18th, one of us (AMF) was able to visit Club Puerto Azul for a second time. We counted Crested Oropendolas arriving at the bamboo cluster late in the afternoon until visibility was limiting (i.e., from 17:00 to 17:40 h). We estimated the total number of Crested Oropendolas by visual counts, differentiating females and males by body size, which have mean weights of 180 g and 300 g, respectively (Hilty, 2003). To better estimate the size and composition of arriving flocks we video-recorded the arrival of individuals into the bamboo cluster. Additionally, we counted the number of Giant Cowbirds (*Molothrus oryzivorus*), a known brood parasite of oropendolas and caciques (Jaramillo & Burke, 1999). These birds were identified by bill coloration (black instead of white) and the lack of yellow tail feathers. Young Crested Oropendolas have darker eyes, but given limited sunlight, it was difficult to determine immature birds. Several individuals flew back to other trees before setting at the roosting site (n = 22), so we took care of not counting them twice. The data obtained from the bird counts are openly available in the Zenodo repository at the following link: https://doi.org/10.5281/zenodo.14060615 (Fernandes *et al.*, 2024)

Crested Oropendolas arrived at the roost in seven discrete flocks, with an average size of 41 individuals/flock. Flocks had 33±8.1 females and 9±2.6 males (mean±SE), and arrived with a difference of ca. 3 minutes between flocks (Fig. 2). A total of 30 birds arrived first (before 17:07 h), but our camera did not record them, so we were unable to assess their sexes with certainty. That is, out of seven Crested Oropendola flocks with 287 individuals, we were able to record six of them (N = 257 oropendolas; Fig. 2). From 17:07 to 17:23 h, we estimated an overall sex ratio of 3.5 females for every male (i.e., 200 females, 57 males). This proportion differs from previous female:male ratio estimations for the species of 6:1 or 8:1 in northern Venezuela (Schäfer, 1953). Birds of both sexes arrived together in five of the six flocks with males leading them (one flock was formed only by

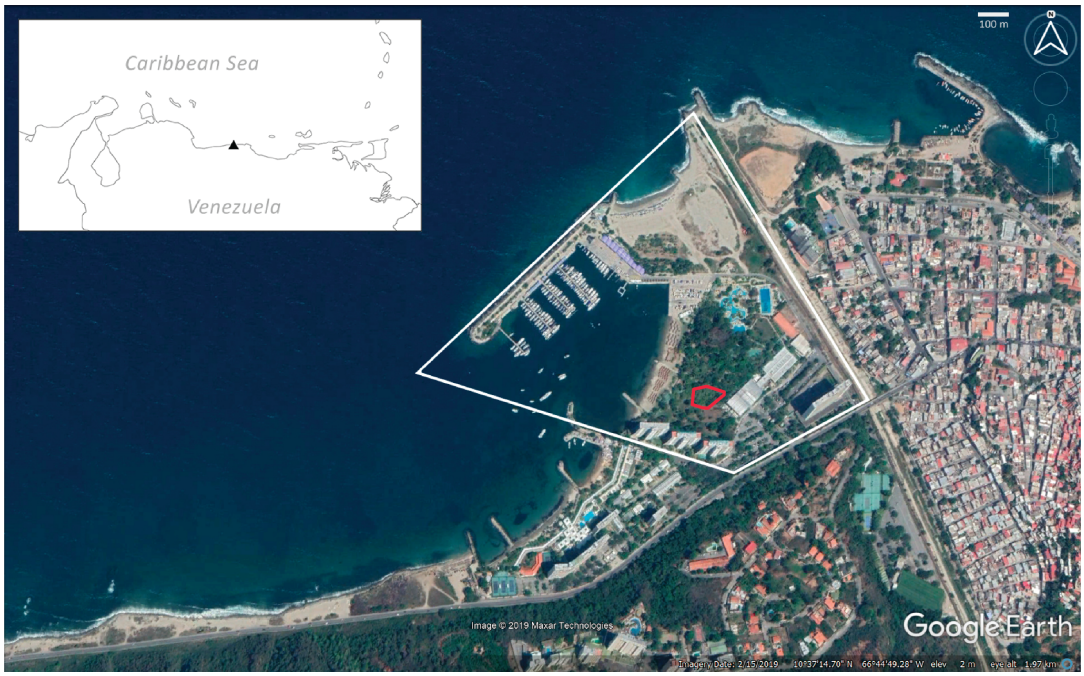

FIGURE 1 Location of the study area (Club Puerto Azul) in northern Venezuela (black triangle in top left corner map). The limits of the study area (white polygon) and the Crested Oropendola roosting site (red polygon) are shown on a satellite view (image edited from Google Earth Pro 7.3.2.5776).

males; Fig. 2). In contrast, Drury (1962) described that female Crested Oropendolas in Trinidad were the first to fly from the colonies to the roost at the end of each day. They did this in groups of 3–30 individuals during the breeding season (18:00–18:30 h, January), with males arriving singly after them (see also Schäfer 1957).

Three oropendola flocks showed an average of 14±4 Giant Cowbirds (mean±SE; Fig. 2), counting with 42 individuals in total. Although it is known that Crested Oropendolas form mixed roosts with other species, including Giant Cowbirds (Jaramillo & Burke, 1999), several *Psarocolius* species aggressively chase cowbirds away at their nesting colonies (Chapman, 1928; Skutch, 1954; Fraga & Kreft, 2007; but see Tashian, 1957). Thus, we wonder if oropendolas' tolerance toward these specialist brood parasites at their roosting sites varies between seasons. Other species roosting on palms near the oropendola roost were Chestnut-fronted Macaws (*Ara severus*), Black Vultures (*Coragyps atratus*), and Brown Pelicans (*Pelecanus occidentalis*). We note that Chestnut-fronted Macaw has also been reported nesting in the same tree along with Olive Oropendolas (*P. bifasciatus yuracares*, Rodríguez-Ferraro 2006).

Due to limited access set by the administration of Club Puerto Azul, we were not able to continue our study. Nevertheless, our limited observations allowed us to pinpoint relevant aspects of Crested Oropendolas' natural history and demography. We consider that the arriving oropendola flocks, consisting of 287 individuals in total, are likely a gathering of multiple nesting colonies. We state this based on known colony mean sizes (<10 nests per colony *sensu* Fraga, 2011; Machado-Stredel *et al.* 2019, 2021), and what has been observed in other oropendola species (*P. montezuma*, M. Webster *pers. comm.*). In nesting colonies, each breeding female attends one nest and it is common to see one dominant male on the nesting tree, with subordinate males being less conspicuous (Jaramillo & Burke, 1999). Through our research on urban colonies in Caracas, we have estimated a mean size of seven complete nests per colony (Machado-Stredel *et al.*, 2021). Hence, our observations suggest that studies during

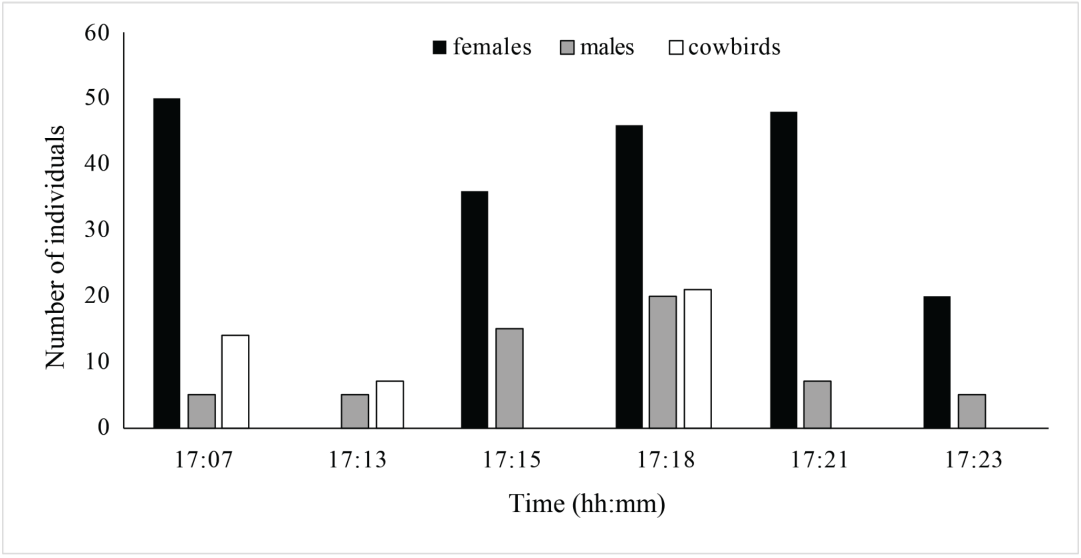

FIGURE 2 Number of observed individuals of Crested Oropendola (females and males) and Giant Cowbird and their arrival times. From the first flock, at least 22 birds flew back and forward to the roost (14 female oropendola, 3 male oropendola, and 5 cowbirds).

the non-breeding season might allow a more complete characterization of these populations while accounting for individuals such as low-ranking males and immatures. Even though monospecific and mixed Cacicinae roosts have been reported elsewhere (Skutch, 1954; Jaramillo & Burke, 1999; Herrera Hernández, 2009), to the best of our knowledge, this work represents the first study that seeks to estimate the abundance and composition of the communal roost of any *Psarocolius*. Developing and expanding monitoring efforts of communal roosting sites over several years will cast light on understanding the social interactions, population dynamics, and natural history of oropendolas and less well-known Neotropical birds.

ACKNOWLEDGMENTS

We thank María Gabriela Castro from Club Puerto Azul for her valuable information about the roosting site and her support during the two observation evenings. Additionally, we are deeply thankful to our field assistants, Isalina De Andrade and Ilad Vivas, for all their help during the visual counts. Lastly, we want to extend our appreciation to Vicky Malavé, Carlos Bosque, and one anonymous reviewer for their comments and constructive input.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

RESUMEN

Descripción de un dormidero comunal de Conoto Negro (*Psarocolius decumanus*) en Venezuela. Los dormideros comunales son sitios clave para el estudio de las interacciones sociales y la dinámica poblacional de animales gregarios. Aunque el comportamiento de pernocta de los ictéridos de Norte América ha sido ampliamente estudiado, los hábitos de las especies coloniales Neotropicales son menos conocidos, especialmente fuera de las temporadas reproductivas. En este estudio caracterizamos un dormidero de Conoto Negro (*Psarocolius decumanus*, Icteridae) durante la temporada no reproductiva en el norte de Venezuela. Durante un día de observaciones, registramos la abundancia, proporción de sexos y horarios de llegada de las bandadas de conotos al dormidero, así como la presencia de otras especies. Siete bandadas de hasta 287 Conotos Negros llegaron al dormidero al atardecer, mostrando una proporción de sexos de 3,5 hembras por macho, en contraste con observaciones previas durante la temporada reproductiva (6:1 y 8:1 hembras por macho). Adicionalmente, documentamos la presencia de Tordos Piratas (*Molothrus oryzivorus*) en el dormidero, un ave que parasita las nidadas de conotos. Nuestras observaciones sugieren que individuos de múltiples colonias de anidación comparten el mismo dormidero, dado que la mayoría de colonias en la región central de Venezuela cuentan con menos de una docena de individuos adultos. Resaltamos la necesidad de estudios futuros que permitan caracterizar la dinámica estacional en la abundancia y composición de los dormideros comunales, así como su rol en las interacciones sociales y los procesos poblacionales de los conotos y otras especies sociales del Neotrópico.

Palabras clave: Aves coloniales, Icteridae, dormidero de especies mixtas, Neotrópico, comportamiento social.

REFERENCES

Aispuro AA. **2012**. Interspecific coloniality in two Amazonian icterids. *Ornitología Neotropical* **23**:193–199.

Ansorge V, Hammerschmidt K, & Todt D. **1992**. Communal roosting and formation of sleeping clusters in barbary macaques (*Macaca sylvanus*). *American Journal of Primatology* **28**:271–280. https://doi.org/10.1002/ajp.1350280405.

Bijleveld AI, Egas M, Van Gils JA, & Piersma T. **2010**. Beyond the information centre hypothesis: communal roosting for information on food, predators, travel companions and mates? *Oikos* **119**:277–285. https://doi.org/10.1111/j.1600-0706.2009.17892.x.

Caccamise DF & Fischl J. **1985**. Patterns of association of secondary species in roosts of European Starlings and Common Grackles. *The Wilson Bulletin* **97**:173–182.

Chapman F. **1928**. The nesting habits of Wagler's Oropendola (*Zarhynchus wagleri*) on Barro Colorado Island. *Bulletin of the American Museum of Natural History* **58**:123–166.

Dolbeer RA, Woronecki PP, Stickley AR, & White SB. **1978**. Agricultural impact of a winter population of blackbirds and starlings. *The Wilson Bulletin* **90**:31–44.

Drury WH. **1962**. Breeding activities, especially nest building, of the Yellowtail (*Ostinops decumanus*) in Trinidad, West Indies. *Zoologica* **47**:39–58.

Eiserer LA. **1984**. Communal roosting in birds. *Bird Behavior* **5**:61–80.

Fernandes AM, Pérez-Emán J, & Machado-Stredel F. **2024**. *Psarocolius decumanus* roost site individual counts. https://doi.org/10.5281/zenodo.14060615.

Finkbeiner SD, Briscoe AD, & Reed RD. **2012**. The benefit of being a social butterfly: communal roosting deters predation. *Proceedings of the Royal Society B: Biological Sciences* **279**:2769–2776. https://doi.org/10.1098/rspb.2012.0203.

Fraga R. **2011**. Family Icteridae (New World Blackbirds). In: **del Hoyo J, Elliot A, & D C** (Eds.) *Handbook of the Birds of the World. Volume 16. Tanagers to New World blackbirds*, pp. 792–993. Lynx Edicions.

Fraga R & Kreft S. 2007. Natural history and breeding behavior of the Olive (*Psarocolius yuracares*) and Yellow-billed (*P. angustifrons alfredi*) oropendolas in Chapare Province, Bolivia. *Ornitología Neotropical* **18**:251–261.

Fraga RM. 1989. Colony sizes and nest trees of Montezuma Oropendolas in Costa Rica. *Journal of Field Ornithology* **60**:289–295.

Grether GF & Donaldson ZR. 2007. Communal roost site selection in a Neotropical harvestman: habitat limitation vs. tradition. *Ethology* **113**:290–300. https://doi.org/10.1111/j.1439-0310.2006.01328.x.

Guaitarilla DA, Ortiz-Pérez JP, Calderón-Leytón JJ, Gómez-Martínez MA, Trujillo-Torres CM, & Fernández RA. 2021. Vocalizaciones asociadas al comportamiento colonial de *Cacicus chrysonotus leucoramphus* (Icteridae) en Colombia. *Biota Colombiana* **22**:133–148. https://doi.org/10.21068/c2021.v22n01a09.

Herrera Hernández JA. 2009. *Biología reproductiva del ave Cacique Aliamarillo (Cacicus melanicterus), en la zona terrestre del Área Natural Protegida Complejo Los Cóbanos, durante 2008*. Undergraduate thesis, Universidad De El Salvador.

Hilty S. 2003. *Birds of Venezuela*. 2nd edition. Princeton University Press, Princeton, USA.

Jaramillo A & Burke P. 1999. *New World Blackbirds: the Icterids*. Princeton University Press, Princeton, USA.

Krauczuk ER, Burgos Gallardo F, Giraudo AR, Bernasconi F, Krause L, Itoiz R, Nicosia S, Haynes P, Cabral F, Franzoy A, Navajas Cantaluppi SA, Petruszynski R, Straube FC, & Baldo JL. 2017. Regresión, expansión, distribución y notas de historia natural de *Psarocolius decumanus* en el límite meridional de su distribución. *El Hornero* **32**:245 – 255.

Lewis SE. 1995. Roost fidelity of bats: A review. *Journal of Mammalogy* **76**:481–496. https://doi.org/10.2307/1382357.

Lindell C & Bosque C. 1999. Notes on the breeding and roosting biology of Troupials (*Icterus icterus*) in Venezuela. *Ornitología Neotropical* **10**:85–90.

Machado-Stredel F, Fernandes AM, Riera F, Gianni R, Rodríguez-Ferraro A, & Pérez-Emán JL. 2019. Monitoreo del Conoto Negro (*Psarocolius decumanus*) en un ecosistema urbano: Una iniciativa de ciencia ciudadana en Caracas, Venezuela. *Revista Venezolana de Ornitología* **9**:4–14.

Machado-Stredel F, Fernandes AMF, Riera F, & Pérez-Emán JL. 2021. A city of oropendolas: Characterization of nesting colonies of Crested Oropendola (*Psarocolius decumanus*) in Caracas, Venezuela. *The Wilson Journal of Ornithology* **132**:259–270. https://doi.org/10.1676/1559-4491-132.2.259.

Meanley B. 1965. The roosting behavior of the Red-Winged Blackbird in the Southern United States. *The Wilson Bulletin* **77**:217–228.

Richner H & Heeb P. 1996. Communal life: honest signaling and the recruitment center hypothesis. *Behavioral Ecology* **7**:115–118. https://doi.org/10.1093/beheco/7.1.115.

Rodríguez-Ferraro A. 2006. Notes on the behavior of the Olive Oropendola (*Psarocolius yuracares*) during the breeding season. *Ornitología Neotropical* **17**:57–62.

Schäfer E. 1953. Resultados parciales de una investigación comparativa de biología de incubación de *Psarocolius decumanus* (Conoto negro) y *Psarocolius angustifrons* (Conoto verde). *Boletín de la Academia de Ciencias Físicas, Matemáticas y Naturales* **16**:155–69.

Schäfer E. 1957. Les conotos: Étude comparative de *Psarocolius angustifrons* et *Psarocolius decumanus*. *Bonner zoologische Beiträge* **8**:1–148.

Skutch AF. 1954. *Life histories of Central American birds: families Fringillidae, Thraupidae, Icteridae, Parulidae, and Coerebidae*. Pacific Coast Avifauna 31. Cooper Ornithological Society, Berkeley, CA.

Tashian R. 1957. Nesting behavior of the Crested Oropendola (*Psarocolius decumanus*) in northern Trinidad. *Zoologica* **42**:87–98. https://doi.org/10.5962/p.203391.

Ward P & Zahavi A. **1973**. The importance of certain assemblages of birds as "information-centres" for food-finding. *Ibis* **115**:517–534. https://doi.org/10.1111/j.1474-919X.1973.tb01990.x.

Webster MS. **1992**. Sexual dimorphism, mating system and body size in New World blackbirds (Icterinae). *Evolution* **46**:1621–1641. https://doi.org/10.1111/j.1558-5646.1992.tb01158.x.

Webster MS. **1994**. Female-defence polygyny in a Neotropical bird, the Montezuma oropendola. *Animal Behaviour* **48**:779–794. https://doi.org/10.1006/anbe.1994.1302.

Wetmore A, Pasquier RF, & Olson SL. **1984**. *The birds of the Republic of Panama. Part 4*. Smithsonian Miscellaneous Collection 150, Smithsonian Institution, Washington, DC.

White SB, Dolbeer RA, & Bookhout TA. **1985**. Ecology, bioenergetics, and agricultural impacts of a winter-roosting population of blackbirds and starlings. *Wildlife Monographs* **93**:3–42.