Ornithology Research (2026) 34:52
https://doi.org/10.1007/s43388-026-00317-9

BRIEF REPORT

Evidence of egg laying by eared dove (*Zenaida auriculata*) in nests of ruddy ground-dove (*Columbina talpacoti*)

Eduardo Guimarães Santos[1] · **Isadora Zavan Santieff**[2] · **Pedro Diniz**[1] · **Marco Aurelio Pizo**[1]

Received: 18 March 2026 / Revised: 27 August 2026 / Accepted: 1 September 2026
© The Author(s) 2026

Abstract

It is well known that birds can lay their eggs in nests of other species. Although obligate brood parasitism has been intensively studied over the past decades, the cases of facultative brood parasitism are harder to detect and confirm, and have received considerably less attention. Here, we report two rare cases of eggs of eared dove (*Zenaida auriculata*) found in nests of, and being incubated by, ruddy ground dove (*Columbina talpacoti*). The extreme rarity of this record (<1% of ruddy ground nests) and large size differences between species provide some support for the egg dumping hypothesis (i.e., eared dove eggs were discarded or laid by mistake). Alternatively, phylogenetic closeness, niche sharing, and use of crop milk by both species to feed nestlings may favor facultative brood parasitism. Perhaps, egg dumping or facultative brood parasitism may be arising following the expansion of these species on human-modified environments and increasing its abundance in those regions, which deserves further investigation.

Keywords Brood Parasitism · Columbiformes · *Columbina talpacoti* · Egg dumping · *Zenaida auriculata*

It is well known that birds can lay their eggs in nests of other species (here named interspecific egg laying). Intentional brood parasitism can be classified as either obligated brood parasitism, where the parasite does not provide parental care to the offspring, entirely depending on the host for reproduction, or facultative brood parasitism, where the parasite lays eggs in its own nests and eventually in nests of host species (Soler 2017). Although obligate brood parasitism has been intensively studied over the past decades (Soler 2017; Lowther and Post 2020; Lowther 2023), the cases of facultative brood parasitism are harder to detect and confirm, and have received considerable less attention (Mann 2017). This is because interspecific egg laying often occurs unfrequently in a population and may represent egg dumping – when nest fails before egg laying or accidental reproductive errors by the female parent (e.g., mistaken a nest to lay the eggs) – rather than the intentional facultative brood parasitism (Krakauer and Kimball 2009; Haraszthy 2019).

Although reports of interspecific egg laying are rare in birds (Haraszthy 2019), a few avian orders have more representant species expressing this behavior. For example, in the order Anseriformes (waterfowls), interspecific egg laying has been documented in more than 35 species (18 genera), and has been frequently observed in many of those species, suggesting this might represent facultative brood parasitism rather than egg dumping (Mann 2017). A similar scenario occurs in Galliformes (landfowls), in which around 4% of a total of 281 species lay their eggs in nests of 29 different bird species; however, the function of this behavior remains unclear in this order (Krakauer and Kimball 2009).

The examples from Anseriformes and Galliformes suggest that facultative parasitism and egg dumping are more frequently observed in precocial birds, suggesting that post-hatching parental care exerts strong selection on the occurrence of interspecific egg laying (Krakauer and Kimball 2009; Mann 2017; Soler 2017; Hertzel 2018). However, this highlights that studies on altricial birds can shed light on novel social and ecological forces that might be driving the evolution of interspecific egg laying. This is the case of the order Columbiformes (doves and pigeons). This order

✉ Eduardo Guimarães Santos
egsantos1991@gmail.com

[1] Instituto de Biociências, Departamento de Biodiversidade, Universidade Estadual Paulista, Rio Claro, São Paulo 13506-900, Brasil

[2] Instituto de Biociências, Programa de Pós-graduação em Ecologia, Evolução e Biodiversidade, Universidade Estadual Paulista, Rio Claro, São Paulo 13506-900, Brasil

Published online: 08 September 2026

includes species that occur in a wide variety of habitats across the world and is characterized by feeding their young with crop milk, a secretion of epithelial cells from the crop that mainly contains water, proteins, and lipids (Winkler et al. 2020).

It is commonly reported that individuals can reuse their own nest, conspecific nests, and even heterospecific nests among Columbiformes (Nice 1922). However, it is uncommon to observe Columbiformes laying eggs in nests of other bird species. Most examples involve the mourning dove (Zenaida macroura) in the Nearctic (Davison 1887). In one case, a mourning dove egg was recorded in a clutch of american robin (Turdus migratorius), been incubated by both species but later found destroyed before hatching; a similar case occur in the next breeding season, but this time the mixed species brood had success and young fledged, with both species acting in nest defense (Raney 1939). A mourning dove egg was also observed in an active nest of northern cardinal (Cardinalis cardinalis) (Bull 1980). Mourning doves was even observed usurping a nest with two eggs of a brown thrasher (Toxostoma rufum) (Pemberton 1921). A Palearctic record includes two eggs of european turtle-dove (Streptopelia turtur) found in an active or abandoned nest of eurasian collared-dove (Streptopelia decaocto) already containing two eggs of this species (Haraszthy 2019).

Here, we report two rare cases of eggs of eared dove (Zenaida auriculata) found in nests of, and being incubated by, ruddy ground dove (Columbina talpacoti). Our opportunistic records are the result of intensive nest monitoring of an avian assemblage along an urbanization gradient between March 2025 and February 2026. In this period, we employed a sampling effort of over 300 hours for nest searching and monitored over 923 active nests from 27 bird species in southeast Brazil (Rio Claro, São Paulo, Brazil; latitude: -22.4095, longitude: -47.5583; unpublished data). These species include three Columbiformes with gradual variation in body size: ruddy ground dove (mass = 46 g), eared dove (122 g), and picazuro pigeon (Patagioenas picazuro) (355 g) (unpublished data). We monitored 246 nests of ruddy ground dove that became active, meaning the two cases of interspecific egg laying represent only 0.81% of these nests.

We identified the species owner of each nest by observing species-specific nest size and architecture (Fig. 1A), parents building the nest, incubating eggs, or feeding nestlings. As the nest monitoring was predominantly carried out at a daily basis since nest building, we could estimate accurately egg laying date and periods of incubation and nestling development: ruddy ground dove (n = 27, incubation period = 12 days, nestling period: 13 days), eared dove (n = 37, incubation period = 14 days, nestling period: 13 days) (unpublished data). From each monitored nest, we measured egg length (long-axis diameter: vertical distance from extreme egg tips) and width (short-axis diameter: maximum perpendicular distance along the large axis). This allowed us to confirm that egg sizes largely differed among the three species of Columbiformes that nest in our study site (Fig. 2) (unpublished data).

The cases of observed interspecific egg laying represented extreme inconsistencies in the size of the egg(s) found in a particular nest in relation to the median size of eggs reported for the vast majority of conspecific nests in the population (Fig. 2):

1º record – A nest of ruddy ground dove found on 07 July 2025 containing one egg of eared dove and one nestling of ruddy ground dove (Fig. 1B). The nest was built on a tree in a residential neighborhood (latitude = -22.404573, longitude = -47.549886). Daily nest visits allowed us to observe the ruddy ground dove nest owners incubating the eggs and feeding the ground dove nestlings until it fledged. We did not observe any parental care being provided by the eared dove at the nest. After the young ground dove fledged, the nest owners deserted and abandoned the eared dove egg unhatched. However, inspection of the abandoned egg revealed the embryo had developed and could had eventually hatched had the incubation period been elongated. Based on the incubation period of the eared dove in the study area, we estimated the eared dove egg was laid between 27 and 29 June 2025, a period in which the ruddy ground dove egg was already incubated.

2º record – A nest of ruddy ground dove found on 22 July 2025, containing two eggs of eared dove (Fig. 1C). The nest was built in a tree inside a house in a residential neighborhood (latitude = -22.402566, longitude = -47.551362). We monitored this nest daily since the incubation period until its depredation before hatching on 26 July 2025. Daily nest visits allowed us to observe the ruddy ground dove nest owners incubating the eggs and feeding the ground dove nestlings until it fledged. We found no signs of ruddy ground dove eggs or nestlings in the nest or nest vicinity, suggesting that ruddy ground dove eggs were not laid or were ejected. We did not observe any parental care being provided by the eared dove at the nest. Based on the incubation period of the eared dove in the study area, we estimate the eared dove eggs have been laid between 12 and 22 June 2025.

Nests of ruddy ground doves and eared doves represented 68% of all nests found during the study (ruddy ground dove = 246, eared dove = 382). Both species seem to benefit from human expansion, increasing in abundance, habitat sharing, and nest site similarities in rural and urban areas (e.g. Murton et al. 1974; Sick 1988; Bucher and Ranvaud 2006; Fontoura and Orsi 2014; Santos et al. 2023; Barco et al. 2024; unpublished data). Both species were

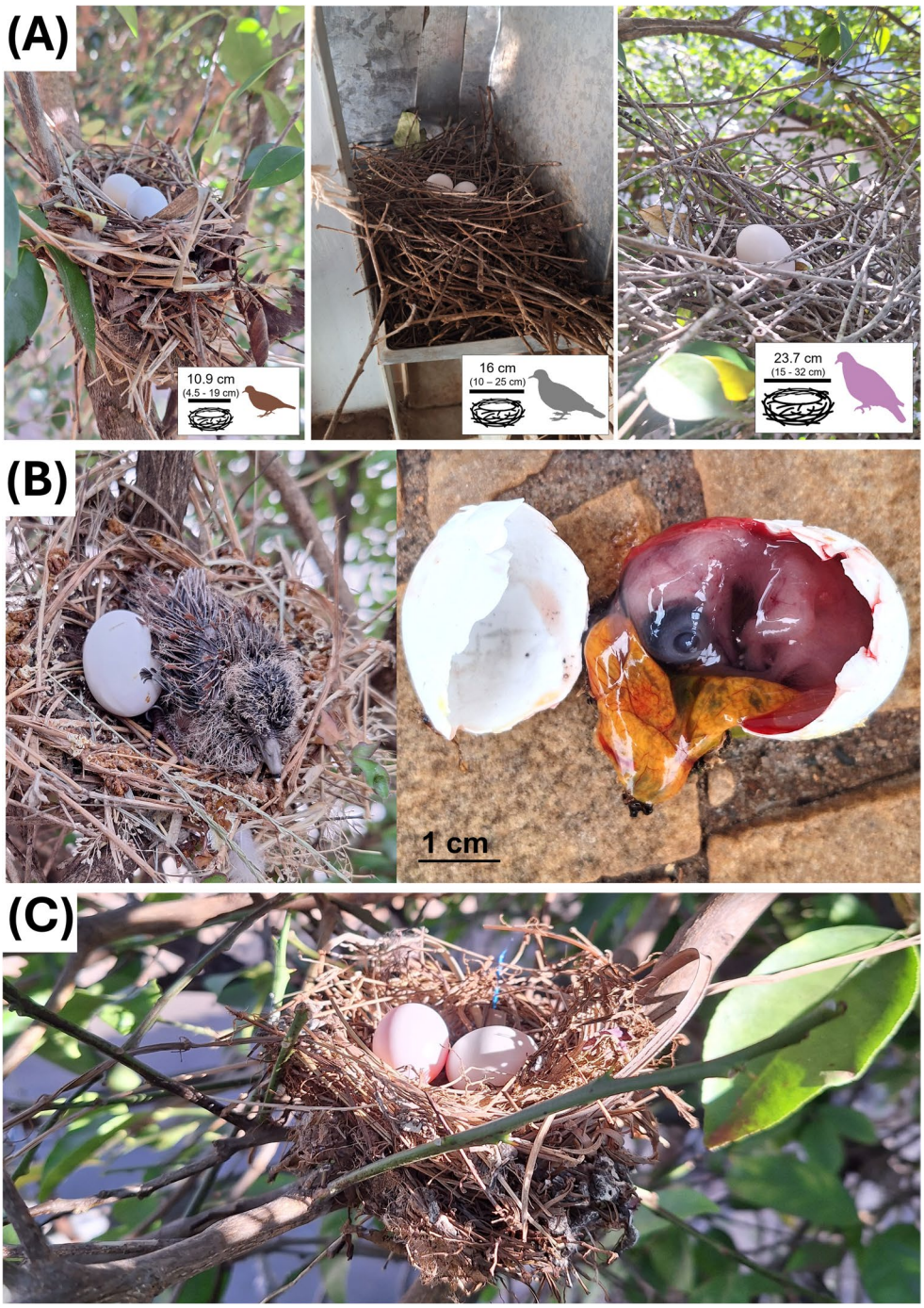


Fig. 1 Nests of ruddy ground dove containing eared dove eggs recorded between 2025 and 2026 in Rio Claro, São Paulo, Brazil. (**A**) Nests of the three Columbiformes species recorded in our study area. From left to right: ruddy ground dove (*Columbina talpacoti*), eared dove (*Zenaida auriculata*), and picazuro pigeon (*Patagioenas picazuro*). We present the average values of the external length of the nests for each species; (**B**) Our first record, showing a ruddy ground dove nestling along with an eared dove egg (on the left). We also present a photo of the well-developed embryo of eared dove (on the right, photo taken after nest desertion by ruddy ground doves); (**C**) Our second record, showing two eared dove eggs inside the ruddy ground dove nest

even observed nesting simultaneously in the same tree during this study (unpublished data). In addition, eared doves are known to reuse or build nests upon nests from their own, of other conspecifics, or of heterospecifics ("nest usurpation", e.g., pale-breasted thrush, Turdus leucomelas and chalk-browed mockingbird, Mimus saturninus; unpublished data). Taken together, these traits might have favored these rare occurrences of interspecific egg laying by increasing the odds of egg dumping and/or favoring intentional facultative brood parasitism.

Although we were unable to determine the actual reason for laying eggs in the nest of another species, the extreme rarity of this record (<1% of ruddy ground nests) and large size differences between species provide some support for the egg dumping hypothesis. Eared doves' nestlings might not be able to be successfully raised by ruddy ground doves. The interspecific egg laying records may have been led by eared dove females having their nest destroyed before egg laying, or not fitting additional eggs, or by the female maladaptively mistaken its nest with a ruddy ground dove nest

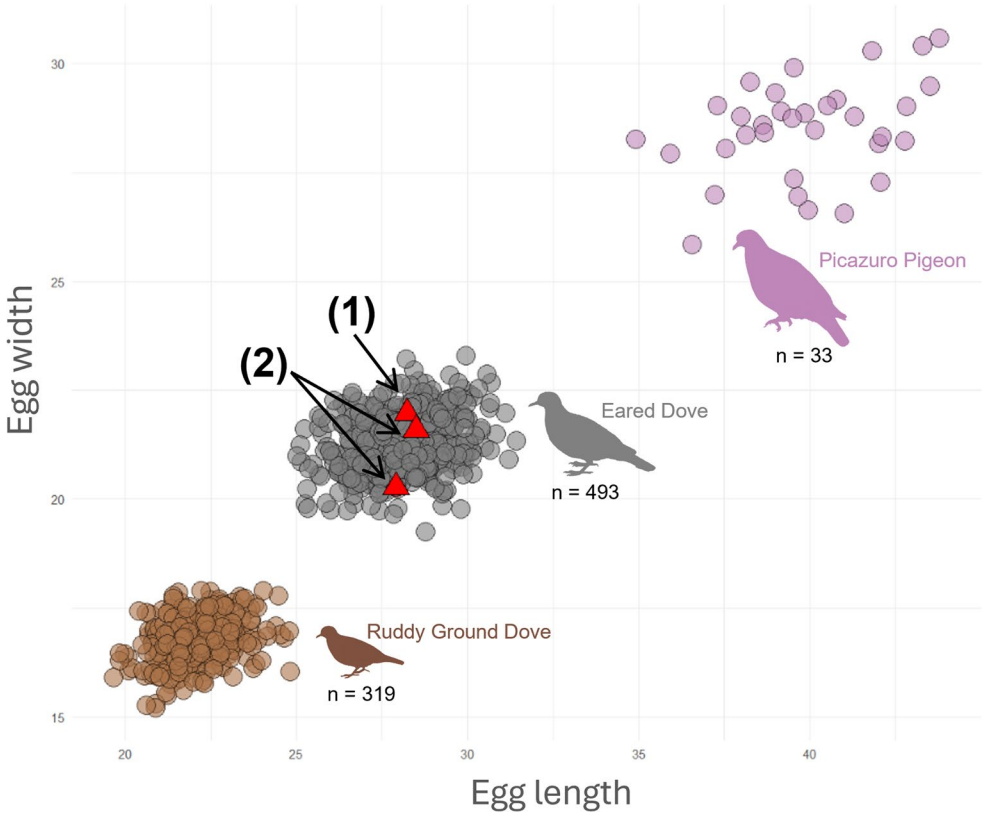


Fig. 2 Egg measurements of three Columbiformes species recorded between 2025 and 2026 in Rio Claro, São Paulo, Brazil. We present the length and width measurements of the eggs, demonstrating the different size distributions for the three species. From left to right: ruddy ground dove (*Columbina talpacoti*), eared dove (*Zenaida auriculata*), and picazuro pigeon (*Patagioenas picazuro*). We also present the sample sizes for each species (number of active nests). Red triangles indicate eared dove eggs recorded in ruddy ground dove nests. (**1**) First record, referring to Fig. 2B (ruddy ground dove nest with an eared dove egg); (**2**) Second record, referring to Fig. 2C (ruddy ground dove with two eared dove eggs)

(Nice 1922; Soler 2017). Nevertheless, we cannot discard the possibility of facultative brood parasitism, especially considering that eared dove nests are a simple structure built quickly. Facultative brood parasitism is not expected to evolve in Columbiformes because they rely on crop milk to feed nestlings, widely constraining the possibilities of host species (Mann 2017). However, the two doves rely on crop milk to feed nestlings. Additional potential benefits for eared doves to lay eggs on rubby ground doves' nests include the abundance of ground doves and phylogenetic and ecological similarities between species (i.e., feeding and nesting habits, including similar incubation and nestling period). In fact, we observed ruddy ground doves incubating eared dove eggs, leading to partial development of eared dove embryo. Perhaps, egg dumping or facultative brood parasitism may be arising following the expansion of these species on human-modified environments and increasing its abundance in those regions, but we do not have enough information to clarify this issue. This issue deserves further investigation.

Acknowledgements We would like to thank Victor Hugo dos Reis and Laura Momis for their help in searching for nests.

Author contributions Eduardo G. Santos: idea, design of methodology, literature revision, writing and editing the manuscript. Isadora Z. Santieff: idea, writing and editing the manuscript. Pedro Diniz: writing and editing the manuscript. Marco A. Pizo: editing the manuscript.

Funding The Article Processing Charge (APC) for the publication of this research was funded by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) (ROR identifier: 00x0ma614). EGS was supported by the Brazilian education agency 'Coordenação de Aperfeiçoamento de Pessoal de Nível Superior' (CAPES) for his post-doctoral studies (PIPD-CAPES-2024). IZS was supported by the Brazilian education agency 'Coordenação de Aperfeiçoamento de Pessoal de Nível Superior' (CAPES-Finance Code 001). PD received a postdoctoral fellowship from the São Paulo Research Foundation (FAPESP), Brazil (Process No. 2024/13237-3). MAP was supported by the Brazilian Research Council (CNPq - #309542/2023-5).

Data availability All data are provided in the manuscript.

Declarations

Ethical approval This study was conducted with approval from the Brazilian environmental agencies Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio, license 97851-2), Centro Nacional de Pesquisa para Conservação das Aves Silvestres (CEMAVE, license 5034), and by an ethics committee (Comissão de Ética no Uso de Animal CEUA/IB/UNESP, nº 0521).

Competing interests The co-author, Pedro Diniz, is an Associate Editor for Ornithology Research. Another member of the journal's editorial board independently handled the peer-review process for this article.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate

if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

References

Barco G, Peralta G, Díaz A, Peluc SI (2024) Características reproductivas de *Zenaida auriculata* (Aves: Columbidae) en ambientes urbanos de la ciudad de Córdoba. Argentina Ecol Austral 34:001–009. https://doi.org/10.25260/EA.23.33.3.0.2236

Bucher EH, Ranvaud RD (2006) S31-4 Eared dove outbreaks in South America: patterns and characteristics. Acta Zool Sin 52:564–567

Bull W (1980) Unusual Egg Deposition in Mourning Doves. Wilson Bull 92:258–260

Davison JL (1887) Birds laying their in the nestes of other birds. Auk 264

Fontoura PM, Orsi ML (2014) Comparative population densities of three species of doves (Columbidae) in disturbed landscapes in Northern Paraná State, Brazil. Rev Bras Ornitol 22:245–250. https://doi.org/10.1007/BF03544254

Haraszthy L (2019) Cases of occasional interspecific brood parasitism and egg dumping in Hungary. Ornis Hung 27:115–141. https://doi.org/10.2478/orhu-2019-0020

Hertzel AX (2018) Letter to the Editors: Comment on Burbidge. Ont Birds 37:50–51

Krakauer AH, Kimball RT (2009) Interspecific brood parasitism in galliform birds. Ibis 151:373–381. https://doi.org/10.1111/j.1474-919X.2009.00916.x

Lowther PE (2023) Lists of victims and hosts of the parasitic cowbirds (Molothrus). Version 16 Oct 2023. Chicago, Illinois: Field Museum. https://www.fieldmuseum.org/blog/brood-parasitism-host-lists. Accessed 10 Jan 2025

Lowther PE, Post W (2020) Shiny cowbird (Molothrus bonariensis), version 1.0. In: Billerman S (ed) Birds of the world cornell lab of ornithology, Ithaca, NY, USA. https://birdsoftheworld.org/bow/species/shicow/cur/breeding. Accessed 22 Dec 2023

Mann CF (2017) A Taxonomic Review of Obligate and Facultative Interspecific Avian Brood Parasitism. In: Soler M (ed) Avian Brood Parasitism. Springer International Publishing, Cham, pp 61–92

Murton RK, Bucher EH, Nores M, Reartes J (1974) The Ecology of the Eared Dove (*Zenaida auriculata*) in Argentina. Condor 76:80–88. https://doi.org/10.2307/1365986

Nice MM (1922) A study of the nesting of mourning doves. Auk 39:457–474

Pemberton JR (1921) Oklahoma Field Notes. Condor 4:133–134

Raney EC (1939) Robin and Mourning Dove Use the Same Nest. Auk 56:337–338. https://doi.org/10.2307/4079074

Santos EG, Pompermaier VT, Wiederhecker HC, Marini MÂ (2023) Urbanisation-induced changes in the morphology of birds from a tropical city. Emu - Austral Ornithol 123:291–302. https://doi.org/10.1080/01584197.2023.2253836

Sick H (1988) Ornitologia Brasileira. Nova fronteira, Rio de Janeiro

Soler M (ed) (2017) Avian Brood Parasitism: Behaviour, Ecology, Evolution and Coevolution. Springer International Publishing, Cham

Winkler DW, Billerman SM, Lovette IJ (2020) Pigeons and Doves (Columbidae), version 1.0. Birds World. https://doi.org/10.2173/bow.columb2.01

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.