

Nesting area, eggs and nestling development of the Common Pauraque *Nyctidromus albicollis* from Venezuela

Abstract

In order to improve our knowledge of the Common Pauraque nesting habits, I collected detailed notes on a nesting event in northern Venezuela. Two eggs laid on fallen leaves were recorded, both conspicuously colored hydrangea pink, heavily marked with vinaceous brown spots. At hatching time, nestlings were born precocial, completely covered with neossophtiles, capable of moving and following their parents. Nestlings moved inside a complex nesting area formed by the nest site *per se* and 11 additional brooding sites where they scrolled 79.9 linear meters around a potential area of 6,362 m². First feather papillae appeared on day 4, and nestlings were completely feathered on day 14. Departing time was on day 15. At that moment, they wore their complete first basic plumage, but had very short white tipped tails, without the white band on wings. Also, the white on throat was absent, and the dorsal region showed a gray tinged tone with a vermiculated black pattern, without the black crescent formed by the scapular feathers. In addition, survival strategies, potential threats and vulnerable situations are reported. The present work fills an important gap in the knowledge of the breeding biology of the Common Pauraque, including the potential area necessary for nesting, the complex movements of the nestlings, the precise departing time, the first basic plumage, as well as specific data on their development, a long-required information, in addition to new survival strategies and potential enemies.

Keywords: avian growth, avian development, breeding biology, Caprimulgidae, nighthawk, nightjar

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Introduction

The Common Pauraque *Nyctidromus albicollis* (Gmelin, 1789) is a widespread species that can be found from south USA (Texas) to north Argentina.¹ With nocturnal and partly crepuscular habits, it rests on the leafy forest floor during the day¹ where their colors blend with those of the dead leaves, impeccably camouflaged. At night, it inhabits open places and roadsides,² even paved roads, where it hunts insects by taking off from the ground and returning.³

Important information about its nesting habits, including its nest,^{1,4-6} eggs,^{4,5,7-9} clutch size,^{5,6,8} parental behavior^{10,11} and survival strategies,^{1,5,10-12} have been collected across the continent. Nonetheless, its nocturnal habits and nestlings' movements have made the data collection difficult and several important aspects are still unknown, including nesting area description, nestlings' departure day, as well as nestling's growth and development, among others.

In Venezuela, the Common Pauraque has records of breeding activity from March to September.^{13,14} Information about its breeding habits is scarce and basically focused on nest site and egg descriptions.^{13,14} Due to the limited knowledge on nesting behavior of the Common Pauraque in the country, and the remaining gaps of information in Neotropics, the present study intends to improve the data on the nesting area, eggs, nestlings' growth (biometry, body mass, and plumage development) and movements, as well as some survival strategies and vulnerable situations, observed in this nocturnal species.

Methods

Study area

The nesting area of the Common Pauraque studied was located in a disturbed zone on the Coastal Mountain Range, southeastern suburbs

of Caracas, near Los Naranjos Farm, El Hatillo County, Miranda state, northern Venezuela (10°26'12" N, 66°47'42" W; ±1,000 m a.s.l). It was close (10 m) to a low transit paved road where Guinea Grass *Megathyrsus maximus* (Poaceae) was predominant along its edges (Figure 1). Other herbaceous plants, such as Mountain Daisy *Oyedaea verbesinoides*, White Crownbeard *Verbesina caracasana* (Asteraceae) and Pull Back Grass *Mimosa candolei* (Fabaceae) were also present. Trees of Possumwood *Hura crepitans* (Euphorbiaceae), Trumpetwood *Cecropia peltata* (Urticaceae), Mesquite *Prosopis juliflora* (Fabaceae) and Spineless Yucca *gigantea* (Asparagaceae) stood out nearby. A little creek (Quebrada Santa Rosa) runs close to the study area (50 m), with a small riparian forest along its edges.

Data collecting

Detailed notes on the nesting area and eggs, as well as nestlings' growth (biometry, body mass, and plumage development) were collected on a daily basis. Notes were taken at 10:00 h every morning. In order to avoid egg/nestling injuries, I never visited the nesting area at night. Because a bird nest is the spot in which a bird lays and incubates its eggs and raises its young, and the Common Pauraque do not make a nest structure, I defined the "nesting area" as the zone where the eggs were laid and incubated, and then nestlings and parents moved around throughout different brooding sites, from the hatching day to the day of the first confirmed flight. The term "brooding site" was employed for each diurnal resting place, because parents always brooded the nestlings during the day even in advanced stage of development. Thus, the "nest site" was restricted to the bare place where the eggs were laid. To calculate the nesting area, nestling movements were recorded. Because the plumage camouflage, the localization of brooding sites was difficult. Therefore, I established a searching area of 10 m radius from the brooding site where they were previously recorded, alert to the movement of the parent when

it was flying scared. Distance between brooding sites was taken with a measuring tape. Nesting area corresponded to the circular area calculated by the expression: $\pi*(D/2)^2$, where Diameter (D) corresponded to the longest distance between two brooding sites. Eggs and nestling were handled by hand, previously sterilized with 100% ethyl alcohol. Eggs' dimensions were measured with a plastic caliper, with 0.01 g readability. Egg color nomenclature was based on Ridgway.¹⁵

Biometric data (length) were collected with a plastic caliper (total, bill, tarsus) and a metallic Avinet™ ruler (wing, tail). The mass of the eggs and nestlings were taken with an electronic precision balance Acculab™ EC-211 model, with 0.1 g readability. Total length was the distance between the bill tip and tail, feathered or not; bill length (culmen exposed) between the naked base and the bill tip; tarsus length between the tibiotarsal joint (ankle) and the first digit articulation; wing length between the wrist joint and the longest primary remex; and tail length between the base and tail tip of the longest feathers. Wing and tail measures were begun when their first feather papillae appeared. Notes on particular events of the plumage development were recorded, including days when the pterygiae were noticeable and the feather papillae opened, among others. Plumage, pterylosis and topographic terminology follow Proctor & Lynch.¹⁶ A photographic sequence of nestling development was also recorded with a Nikon™ Coolpix P510 camera. In addition, survival strategies (e.g. distraction display) and potential threats (e.g. nest predators) were documented. Information on literature associated to the Common Pauraque nesting was provided by Latta & Howell¹ & Matta-Pereira.¹⁷

masses of 6,9 and 7,4 g. Eggs were conspicuously colored of hydrangea pink heavily marked over most of the surface with vinaceous brown spots, smooth in texture and non-glossy, and were laid directly on fallen leaves Figure 2b under the shadows of a Mesquite tree, poorly surrounded by Guinea and Pull Back grasses, almost directly on a trail (30 cm aside) used by humans (A–B section, Figure 1). The Mesquite canopy was 3 m over the ground and shadowed an area of 30 m² approximately. On the ground, pieces of its thorny branches were also present.

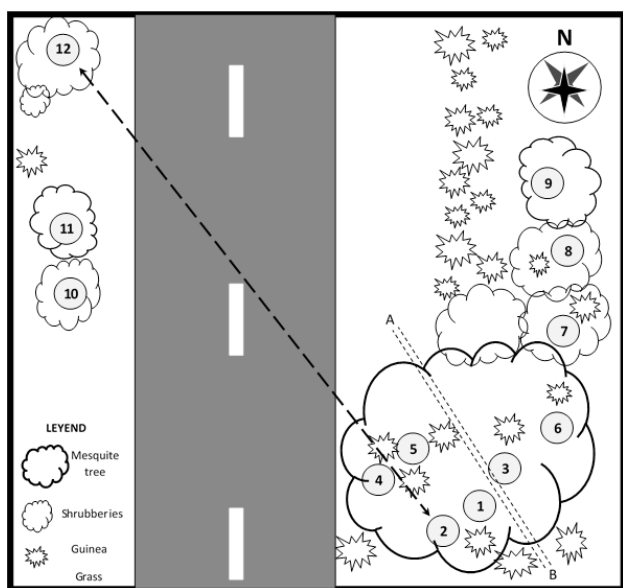


Figure 1 Schematic nesting area of the Common Pauraque *Nyctidromus albicollis* showing the nestlings' movements from the hatching day to the first flight day. Numbers inside circles: brooding sites. A–B section: trail. Arrow dotted line: longest distance between two brooding sites. Distances between brooding sites (meters): 1–2: 1.1; 2–3: 2.3; 3–4: 3.7; 4–5: 1.5; 5–6: 5.5; 6–7: 9.0; 7–8: 8.0; 8–9: 7.5; 9–10: 21.0; 10–11: 5.3; 11–12: 15.0. Longest distance between brooding sites (2 and 12): 90. Distances in picture are relative (no metric scale).

Results

Eggs

On 13 April 2023, two eggs were discovered when an adult pauraque (Figure 2a) flew away, scared. Eggs were measured on the day of discovery. Dimensions (mm): 29.9 x 21.1 and 28.2 x 21.0; with



Figure 2 The Common Pauraque *Nyctidromus albicollis* studied in northern Venezuela: a, the motionless male incubating and showing its intimidation plumage design; b, both eggs on nest site, laid directly on fallen leaves; c, the newly-hatched nestlings and a half eggshell; d, first day nestling with cottony aspect, fully covered with long and soft neossoptiles; crown and wings highly contrasts with body plumage; e and f, dorsal and ventral view on the second day, respectively. Photos: ©C. Verea.

Nestlings: hatching time, body masses, plumage development, and movements

Two newly-hatched nestlings Figure 2c were found on April 27, 2023. They had body masses of 4.0 and 4.8 g. Table 1 shows the biometric and body mass data collected. Nestlings moved from the nest site throughout 11 brooding sites along the 16 days of data collection. Both the nest site and most of the brooding sites (75%) were placed in semi-open, shadowed locations (sites 1–9, Figure 1) while the remaining places (25%) were in open shadowed locations (sites 10–12, Figure 1). Nestling movements (Figure 1) and plumage development (Figure 3) were as follow:



Figure 3 Common Pauraque *Nyctidromus albicollis* plumage development: a, wing papillae appeared (day 4); b, dorsal pteryxae wrinkled and bumpy (day 5); c, wing coverts, tail, interscapular and pelvic tracts papillae appeared (day 7); d, wing papillae opened (day 7); e, crown design and uropygial gland appeared (day 9); f, dorsal region with a vermiculated pattern (day 10); g, remiges barbs expanding (day 11); h and i, ventral and dorsal views (day 13), respectively; nestlings almost completely feathered, only few neossoptiles remain on forehead; primary remiges still extending; the white band, typical of adult's wings, still absent. Photos: ©C.Verea.

Table 1 Body masses and biometry data (total length, bill, tarsus, wings, and tail) collected from nestlings of the Common Pauraque *Nyctidromus albicollis* studied in northern Venezuela.

Day	Mass	\bar{x}	Total	\bar{x}	Bill	\bar{x}	Tarsus	\bar{x}	Wing	\bar{x}	Tail	\bar{x}
1	4.0–4.8	4.40	45.1–45.5	45.30	1.0–1.1	1.05	9.0–9.2	9.10	-	-	-	-
2	7.3–7.9	7.60	48.7–49.0	48.85	1.5–1.7	1.60	10.4–11.1	10.75	-	-	-	-
3	9.9–10.3	10.10	53.4–57.2	55.30	1.9–2.1	2.00	11.6–11.9	11.75	-	-	-	-
4	13.4–13.4	13.40	59.6–59.7	59.65	2.0–2.1	2.05	13.4–14.0	13.70	20.1–22.7	21.40	-	-
5	17.5–17.7	17.60	61.8–63.2	62.50	2.3–2.5	2.40	13.8–14.8	14.30	23.5–24.1	23.80	-	-
6	19.0–20.5	19.75	64.5–65.4	64.95	2.6–2.7	2.65	14.6–15.4	15.00	27.8–33.4	30.60	-	-
7	24.0–25.2	24.60	68.8–71.0	69.90	2.7–2.7	2.70	15.3–16.4	15.85	32.8–38.8	35.80	3.3–4.0	3.65
8	28.0–29.1	28.55	72.8–73.0	72.90	2.7–2.9	2.80	16.2–17.1	16.65	40.0–41.0	40.50	5.0–7.7	6.35
9	29.3–31.2	30.25	73.5–75.7	74.60	2.8–2.9	2.85	17.9–19.0	18.45	46.7–47.9	47.30	8.2–9.1	8.65
10	30.9–31.6	31.25	79.9–81.3	80.60	2.9–3.0	2.95	19.3–19.5	19.40	55.0–59.0	57.00	16.0–16.0	16.00
11	35.5–36.7	36.10	80.6–81.5	81.05	3.0–3.0	3.00	19.9–20.5	20.20	60.0–63.0	61.50	18.0–19.0	18.50
12	35.0–36.1	35.80	87.7–89.5	88.60	3.1–3.5	3.30	20.0–20.5	20.25	68.0–71.0	69.50	22.0–23.0	22.50
13	36.6–37.2	36.90	96.5–99.0	97.75	3.3–3.5	3.40	20.3–21.5	20.90	78.0–80.0	79.00	25.0–26.0	25.50
14	37.8–39.5	38.65	100.3–102.0	101.15	3.6–3.9	3.75	21.8–22.3	22.05	78.0–81.0	79.50	28.0–31.0	29.50
15		37.0		101.80		4.90		22.0		88.0		33.0

Day 1: hatching day. Body mass in grams; biometry data in millimeters (mm). \bar{x} : average. Dash (-) symbol: datum not collected.

Day 1: Two nestlings and a half eggshell at 10:00 h (Figure 2c). Nestlings were completely covered with long and soft neossoptiles (=downy hatching plumage), cottony aspect (Figure 2d). Neossoptiles: tawny (crown, forehead, supercilium, wings, ventral region, tail), cinnamon (dorsal region), and dark smoky (chin, throat, chest, lore, malar and auricular areas); crown highly contrasted with throat and chest; tawny line along dorsal area; dorsal plumage camouflaged with fallen leaves and understory shadows. Eyes partly open, deep black; bill gray with black tip; nostrils conspicuous; feet blackish above, grayish below; nails cream; digit 3 remarkably long. Precocial: few steps or hops when handled. They also uttered a low nasal sound, and responded by raising their heads to the calls of the parent.

Day 2: Nestlings moved 1.1 m from prior location (site 2, Figure 1). No appreciable changes on plumage development.

Day 3: Nestlings remained on prior location. No appreciable changes on plumage development.

Day 4: Nestlings moved 2.0 m from prior location (site 3, Figure 1). Wing papillae appeared (primary and secondary remiges) (Figure 3a). Ventral region with no changes (neossoptiles remain).

Day 5: Nestlings remained on prior location. Dorsal pterygia wrinkled and bumpy (Figure 3b); scapular papillae appeared. Ventral region with no changes (neossoptiles remain).

Day 6: Nestlings moved 2.5 m from prior location (site 4, Figure 1). Wing and scapular papillae were remarkably enlarged and acuminate. Both areas turned blackish: imminent opening. Papillae of ventral sternal tract appeared.

Day 7: Nestlings remained on prior location. Papillae from wing coverts, tail, interscapular tract, and pelvic tract, appeared; wing papillae (remiges) open (Figure 3d), first barbs cinnamon with black tip, brush-like aspect. Ventral sternal papillae enlarged and acuminate. Rest of ventral region with no changes (neossoptiles remain).

Day 8: Nestlings moved 1.0 m from prior location (site 5, Figure 1). A few papillae appeared on crown. Wing coverts, tail, and scapular papillae open, light cinnamon, brush-like aspect. Pelvic papillae enlarged and acuminate. Ventral sternal papillae open, tawny in color. Rest of ventral region with no changes (neossoptiles remain).

Day 9: Nestlings moved 5.0 m from prior location (site 6, Figure 1). Crown papillae open, and crown pattern appeared: black dotted feathers (Figure 3e). Wing coverts completely open, light cinnamon on tip, base brown, and a black dot in between. Barbs of remiges lightly extended, cinnamon on tip, base black. Most scapular feathers open, gray in color with a black dot in the middle. Pelvic and tail papillae slightly open, gray in color, latter with a black reticulated pattern. All chest (upper and lower breast) covered by the new ventral sternal feathers, tawny. A few black barbs appear on upper breast. Rest of ventral region with no changes (neossoptiles remain). The uropygial gland appears.

Day 10: Nestlings moved 9.0 m from prior location (site 7, Figure 1). Most head, except crown, still dominated by neossoptiles. Scapular and back areas fully feathered, grey with black dots, forming a vermiculated pattern (Figure 3f). Pelvic papillae open, creating a lineal black dotted pattern on rump. Barbs of remiges still extending, mostly black, cinnamon on tip. Chin and throat still dominated by neossoptiles, dark in color. A black reticulated pattern on upper and lower chest is evident. Crissum (undertail coverts) dominated by neossoptiles, tawny in color.

Day 11: Nestlings moved 8.0 m from prior location (site 8, Figure 1). Auricular feathers appear, cinnamon in color. Short and robust rectal

bristles papillae are now evident. Also, several papillae on crown and nape emerge. Remiges barbs expanding (Figure 3g). White feathers on tail appeared.

Day 12: Nestlings moved 7.0 m from prior location (site 9, Figure 1). Loreal feathers appear and nape papillae open. Secondary remiges fully extended, primary remiges still growing, both mainly black. Nestlings feathered except some areas on head (forehead, supercilium and throat).

Day 13: Nestlings moved 21.0 m from prior location (site 10, Figure 1) and crossed the paved road (Figure 3). Superciliary and throat feathers appeared. Primary remiges still extending. External black feathers on tail appear. Nestlings almost completely feathered, few neossoptiles remain on forehead (Figures 3h,i).

Day 14: Nestlings moved 5.0 m from prior location (site 11, Figure 1) and were completely feathered, without neossoptiles. Wing feathers totally extended, no white band. Tail short. Hard to handle, restless. When I took one nestling, the other one ran hurriedly, flapping its wings.

Day 15: At 10:00 h I could not find the nestlings after 60 minutes of searching. At 20:00 h, I explored the area with a flashlight looking for the red reflection of their eyes. After a few minutes, I found only one nestling in company of the male. They were moved 15.0 m from prior location (site 12, Figure 1). When I tried to handle it, it ran quickly, helped by the movement of the wings, almost taking off from the ground, practically unreachable. It already resembled an adult individual with a short tail and no white band on wings.

Day 16: I failed in my morning search. At night, I found a lonely nestling (no parents around) resting on fallen leaves of site 12 with no apparent plumage changes since the day before. I tried to capture it, but when I approached 1 m distance, it flew incredibly fast, landing 50 m away on a scrub, unreachable.

Nesting area

The longest distance between brooding sites was 90 m (sites 2 and 12, Figure 1) and the potential nesting area was calculated in 6,362 m². Nestlings traveled a total of 79.9 linear meters, with a minimal distance between brood sites of 1.0 m and a maximum of 21 m.

Survival strategies

Plumage camouflage, both parent and nestlings; plumage intimidation design, motionless parent, distraction display, and mobbing behavior.

Potential threats and vulnerable situations

The Yellow-headed Caracara *Milvago chimachima* was the only potential wildlife threat recorded. Both nestlings crossed a paved road with automobile transit on day 13.

Discussion

Eggs

Egg dimensions were 21.0–29.9 mm ($n=2$), a value lightly superior than 20.5 x 28.5 mm ($n=3$) reported by Cherrie¹³ in Venezuela, but within 20.1–36.2 mm rank ($n=68$) reported by several authors.^{7–9} Also, the egg masses recorded here (6.9–7.4 g) were within 6.5–8.2 g rank ($n=10$) reported in Neotropics,^{1,4,18} both results expected. Cherrie¹³ described the eggs in Venezuela as pale vinaceous buff in color, marked all over with irregular spots and blotches of vinaceous brown, based on color nomenclature of Ridgway.¹⁵ But

oddly, “pale vinaceous buff” color does not appear in Ridgway’s work. Nonetheless, that description does not differ noticeably from the hydrangea pink of my observations. Some subjective descriptions, without color nomenclature reference, include pinkish pale grey,¹¹ pinkish buff,^{8,9} pinkish cream,⁶ pinkish to pale cinnamon,¹⁹ salmon,⁴ pale salmon-pink,¹² salmon buff, and brighter than vinaceous buff,¹ marked with reddish brown, cinnamon, and/or pink,¹ all eye-catching colors. Eggs were not moved from original nest site, not even in response to daily disturbances due to nest visiting, a finding in concordance with Alvarenga.¹¹

Incubation

Because incubation was advanced, I only recorded 14–15 days, less than 19–20 days estimated by Skutch.¹⁰ Alvarenga¹¹ recorded 22 days from the moment when two eggs were discovered until two nestlings appeared close to their eggshells. But without the record of the day when egg one was laid, the precise incubation period is still unknown. Although male and female both incubate,⁵ I never observed the female incubate or brood in my morning routines. It is known that females are more active incubating at night, while males are during the daytime.¹² This explains why I only observed the male running such activities.

Nesting area

As in previous reports, eggs were simply laid on flat ground covered by dead fallen leaves without any additional nest material,^{4,6,9,20} or saucer-like depression.¹ However, the nesting area was complex, formed by the nest site per se and 11 additional brooding sites where parent/nestlings moved around a potential area of 6,362 m², a finding described for the first time. Alvarenga¹¹ described a nesting area of 300 m², but his observations were restrained to the first days after hatching. While nest sites are found in both shadow and direct sun,²¹ all sites inside the studied area were shadowed. Marini²⁰ in Brazil, also found that nest sites are located in shadowed spots of fairly open sites. Sites in this study were open enough to allow, in the first instance, the escape of the parents without difficulties, and to perform distraction displays from a visible, safe and distant place (4–6 m away) to draw my attention or the attention of any other marauder. Also, I observed that the parent and nestlings moved together to nearby shadowed places (30–40 cm) around a brooding site when the sunlight hit directly on them. Thus, minor movements occur during the day, likely linked to thermoregulation, while larger movements occur at night, probably stimulated by the parent calls during the feeding activity. According to Skutch,¹⁰ pauraques nest in the shade, where they have less need to cool themselves.

Nestlings’ development

Nestlings were precocial, born completely covered by neossopiles and fully developed sense organs and motor skills, capable to move (hop, walk) to follow their parents in response to their calls since the first day,²² a condition found in several Charadriiformes.²² However, Skutch¹⁰ calls them semiprecocial, because they combine the characteristics of altricial nestlings and precocial chicks, a denomination followed by Cleere¹² and Latta & Howell.¹ But the former author calls them semi-altricials afterwards,²⁵ an unclear situation. Only Latta & Howell,¹ report a mass of 5.5 g on day of hatching in Costa Rica ($n = 1$), a datum higher than reported in this study. Thus, the expected body mass of the Common Pauraque at hatching time now ranks 4.0–5.5 g ($\bar{x} = 4.8$). Newly-hatched nestlings were described covered in brown and pinkish-buff neossopiles by Cleere,¹² a plumage coloration that differs from my observations, but the author does not mention the subspecies involved. Nestling

description given by Skutch¹⁰ matches more appropriately with my findings: sides of the head and the back, chestnut-brown; crown, stripe along the center of the back, sides and under parts of the body, tawny. No previous information on growth rates was known for the Common Pauraque.¹² Circumstantially, Skutch¹⁰ only comments on the presence of white tips on the outer tail feathers in a young bird already feathered. Similarly, Marini²⁰ report scattered data on biomass of a pauraque’s nestling. Now, a detailed day-by-day description on biometric data, biomass gain, and plumage development is available from the hatching day to the first flight day (15). First feather papillae appear on day 4, and nestlings were completely feathered and absent of neossopiles on day 14. On day 15, one nestling was missing, and I doubtfully assumed it had flown and initiated its independent life. Throughout my observations, one nestling was more active and developed than the other. Perhaps, when I discovered both nestlings the hatching morning, one of them was likely born the afternoon before. Skutch¹⁰ points out that eggs hatched on successive days, with a differential time of up to 27 hours. This explains why the second nestling departed on day 16. Thus, the departing time for each nestling was certainly on day 15, less than 23 days reported by Latta & Howell.¹ At departing time, both nestlings wore their complete first basic plumage, but had very short white tipped tails, and without the white band on wings. The white throat was also absent, and the dorsal region was gray with a vermiculated black pattern, without the black crescent formed by the scapular feathers. Based on Monroy-Ojeda,²³ the white band on wings should appear after the first pre-basic molt. For the following nine days there were no nestlings’ sightings. Only a lonely male was sighted six days after at night. So, I assumed that the pauraques have moved to other places, so I stopped my daily search.

Nestling movements

Most literature informs nestling movements since hatching time,^{5,11,20} but little information is known on this topic. Slud,²⁴ points out that nestlings do not occur in the same spot on successive days, but I observed that they stayed in the exact same brooding site on three occasions (days 3, 5, and 7). Ferreira de Vasconcelos⁵ also inform immobility of the nestlings on day 2. Without previous evidence on literature, I can only infer that there was a plenty hunting and a complete food supply by the parents which avoided the need to beg and move to a new spot following them. My data also indicates maximum biomass gains on days 5 (4.2 g) and 7 (4.85 g) which supports this idea. On the other hand, Alvarenga¹¹ and Ferreira de Vasconcelos⁵ inform a rank of 3.0–14.8 m the first days after hatching. In agreement with them, I recorded 1.0–9.0 m movements the first days after hatching too. But larger movements (up to 21.0 m) were also recorded, particularly previous to the day of the first flight, a fact likely linked to a better development of the wings. Also, a complete tour of 79.9 linear meters within the nesting area is disclosed within this work. In spite of their complex movements, nestlings stayed together at all times until day 14, the day before the first flight. Alvarenga¹¹ also noticed that young birds always stay together.

Survival strategies

A set of strategies were carried out by the Common Pauraque to guarantee the survival of the eggs, nestlings and adults themselves. First, pieces of thorny branches on the ground, as well as spine-armed plants, were present in the nesting area, a strategy probably focused to deter predators, all of them uncomfortable for humans at least. Latta & Howell,¹ also reported nests usually among thorny cactus. Also, eye-catching eggs were kept constantly covered by a motionless parent during the day, a strategy associated with reducing the conspicuousness of the colored eggs to predators²⁵ because the

plumage camouflage of parents blends perfectly with the dead leaves on the ground. The parent was so confident in his camouflage that he only flew away when I approached 1 m or less. Similar behavior was reported by Ferreira de Vasconcelos.⁵ But before starting the flight, he gently opened his eyes as I got closer until opening them completely. As Pauraque's eyes are directed sideward, it seems to be looking directly at its observer when viewed from behind.¹⁰ The last author also noticed a line of dark feathers in the center of the nape that simulates a bill, hence it is easy to imagine that the bird has turned its head straight backwards to look at the intruder. Below, on the back, a crescent of wide black feathers also simulates a big mouth, all in a context of intimidation (Figure 2a). Perhaps there is some protective advantage in this plumage intimidation design, a visual deception.¹⁰ Despite its simple color, nestling neossopites also blend with the litter on the ground. Nonetheless, close to the newly-hatched nestlings, a half eggshell still remained. Although empty eggshells are supposed to be removed and carried away by parents,^{10,25} birds also eat the eggshells from their own nestlings, helping to replenish the adult bird's calcium,²⁶ and keep the nest site clean and free of evidence that there are vulnerable hatchlings around, so I do not discard this possibility. As expected, eggshells were not present the day after hatching. Every time that I visited the nesting area, the male performed injury-feigning distraction displays, such as have a broke wing, beating the ground with his flipper-like wings half-opened, and uttering a low frog-like gargle, with his eyes fully opened, and the beak half-closed. This strategy is the most ubiquitous and frequently mentioned in literature.^{1,5,11,12} On day 15, when I took the nestling, the male performed the habitual distraction display. But as I ignored him completely, he mobbed me. Five times the male flew against me, almost touching my head, and once touching my back, trying to force me to release the nestling, which called to him desperately while I handled it. There are no previous records of mobbing behavior in the Common Pauraque²⁷ or any other Caprimulgidae species, as far as I know. Direct escape, an additional survival strategy mentioned by Ferreira de Vasconcelos,⁵ was never recorded in this study. Once discovered, the male always performed the distraction display, and then flew away to hid behind a bush 10 m apart.

Potential threats and vulnerable situations

Though the Yellow-headed Caracara was recorded for five days around the nesting area, it was unable to notice the presence of the motionless and camouflaged pauraques. Thus, the riskiest event was when the nestlings crossed the paved road (day 13). I have collected three adult pauraques struck down at the same road in the past five years. Fortunately, this road has low automobile traffic, and the nestlings resulted unharmed in their journeys. Cleere¹² lists a set of vulnerable situations for the nestlings, from various potential predators including birds, mammals, reptiles, and fire ants; to trampling by cattle, ground fires, and flooding.

Conclusion

The present work fills an important gap in the knowledge of the breeding biology of the Common Pauraque, including the potential area for nesting, the complex movements of the nestlings, the precise departing time, the first basic plumage, as well as specific data on their development, a long-required information, in addition to new survival strategies and potential enemies.

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Conflicts of interest

The author declared that there are no conflicts of interest.

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