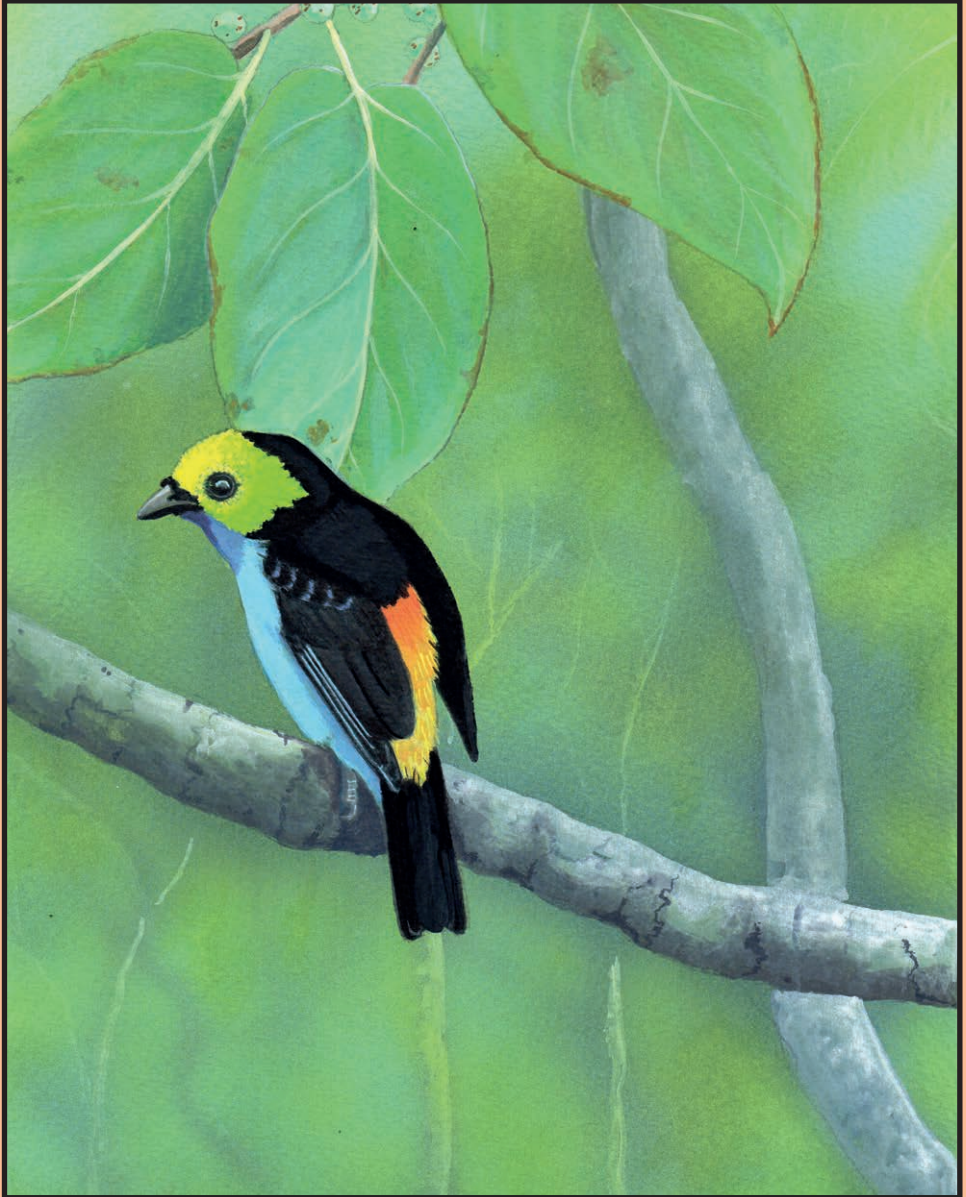




# COTINGA

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## Nesting record of Swallow-tailed Cotinga *Phibalura flavirostris* in the Atlantic Forest of Santa Catarina, southern Brazil

João Paulo Gava Just and Vanessa Claudino Bitencourt

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A tesourinha-da-mata *Phibalura flavirostris* é uma ave Neotropical de aparência marcante, com duas subespécies reconhecidas. No entanto, a biologia reprodutiva da subespécie nominal, que ocorre na Mata Atlântica, ainda é pouco conhecida. Este estudo registra um evento de reprodução de *P. f. flavirostris* em Santa Catarina, sul do Brasil. O ninho, uma pequena taça feita de líquens (*Usnea* sp.), foi construído na forquilha de uma árvore, a 7 m de altura, dentro de um pomar em uma reserva ambiental particular em Nova Veneza. O monitoramento ocorreu entre 14–22 de novembro de 2024, período em que ambos os adultos participaram da incubação. O ninho foi abandonado sem ovos após 8 dias, possivelmente devido à predação ou a condições climáticas adversas. Esses resultados ressaltam a necessidade de mais estudos para identificar os fatores que influenciam o sucesso reprodutivo de *P. f. flavirostris* e para subsidiar esforços de conservação dessa subespécie.

Cotingas are a remarkable group of Neotropical birds that have garnered increasing attention in recent decades<sup>12</sup>. Studies of their breeding behaviour have significantly contributed to understanding avian reproductive systems in the region<sup>6,12,19</sup>. Among them, the Swallow-tailed Cotinga *Phibalura flavirostris* stands out for its striking plumage and distinctive forked tail. Traditionally, two allopatric populations are recognised as subspecies, even though some authors suggest they are separate species<sup>12,13</sup>. Here, we follow the subspecies treatment. The nominate subspecies *P. f. flavirostris* primarily inhabits the Atlantic Forest region in forest, forest borders, and even gardens and meadows with isolated trees, occurring from northeastern to southern Brazil, in eastern Paraguay and in northeastern Argentina<sup>13</sup>, whereas *P. f. boliviana* is restricted to the yungas forests, semi-humid open woodlands and highland savannas in the foothills of dpto. La Paz, western Bolivia<sup>1,7,13</sup>. The Bolivian subspecies has been relatively well-studied in terms of its breeding biology, with detailed accounts available<sup>1-4,7</sup>.

The nominate subspecies is relatively uncommon to rare at most sites where it occurs, and our understanding of its breeding ecology and seasonal movements remains limited, leaving significant gaps<sup>13</sup>. However, the few published studies and scattered unpublished citizen-science records from Brazil suggest a consistent pattern that warrants further investigation: nests are cup-shaped and mostly constructed of lichens, attached to tree branches at the edges of forested areas, and typically built during the spring and summer<sup>13</sup>. Additionally, while the species may tolerate disturbed habitats for breeding in some areas, it remains closely associated with forested

matrices. Regarding incubation and parental care, both sexes are known to participate, but no quantitative assessments have been made of their respective contributions<sup>13</sup>. The scarcity of robust data across distinct environments in its range might hinder broader ecological interpretations, which are important for informing threat status assessments and conservation practices.

In this paper we document a novel breeding record of *P. f. flavirostris* in the Atlantic Forest of Santa Catarina state, southern Brazil—an area with few documented nesting events for this species<sup>12,13,19</sup>. This study provides observations on key breeding aspects of this subspecies, particularly nest architecture, placement and incubation behavior.

### Observations

Field observations were conducted at Área Particular de Proteção Ambiental Reserva São Francisco, in the municipality of Nova Veneza, Santa Catarina, Brazil. This privately protected area spans c.1,500 ha in the foothills of the Serra Geral mountain range, at 200–1,100 m elevation. The vegetation is predominantly composed of secondary remnants of submontane and montane dense ombrophilous forests in intermediate to advanced stages of regeneration<sup>21</sup>. The understorey is dense and highly diverse, featuring a rich assemblage of epiphytes, terrestrial herbs, mosses and lichens, while the canopy reaches heights of up to 20 m (pers. obs.). The regional climate is subtropical, consistently humid, with no distinct dry season. Mean annual temperatures range from 17.0–19.3°C, while annual precipitation (1,220–1,660 mm) is distributed throughout the year, without clear wet and dry seasons<sup>8</sup>.



Figure 1. Overall view of the nesting area of Swallow-tailed Cotinga *Phibalura flavirostris* at Reserva São Francisco, Nova Veneza, Santa Catarina, Brazil, November 2024 (Vanessa Claudino Bitencourt). The white arrow indicates the exact position of the nest in the pecan tree *Carya illinoensis*. Note the short distance to the reserve building.



Figure 2. Pair of Swallow-tailed Cotinga *Phibalura flavirostris* (**A–B** female, sexed by olive wings and paler grey head; **C–D** male, sexed by black wings and head) incubating on nest, Reserva São Francisco, Nova Veneza, Santa Catarina, Brazil, 17 November 2024 (Sidney José Damiani). On this day, the heat index reached 36°C, causing the birds to keep their bills open at times in order to regulate body temperature.

Information on the nesting behavior of *P. flavirostris* at Reserva São Francisco was collected through focal *ad libitum* sampling for interaction observations, which allowed us to record infrequent or unpredictable events. Observations totaled 270 minutes and were conducted on 18, 19 and 22 November 2024, with observers located c.30 m away from the nest, a safe study distance recommended by Avalos<sup>3</sup>. Observations were carried out using 10×42 mm binoculars and cameras equipped with 300 mm and 500 mm lenses. On 14, 16, 17, 20 and 21 November we collected additional indirect data through conversations with reserve staff.

Male and female were distinguished by the boldness of their plumage coloration (female: less intense), particularly wing colour (male: black; female: olive) and mask colour (male: blacker; female: greyer)<sup>13</sup>. Data collected included nest height above the ground, nest materials, nest structure and support, incubation patterns and adult behaviour. The tree circumference was measured using a 1-m measuring tape, while its height was visually estimated based on a tree of known height. Additionally, to further understand the nesting sites and breeding ecology of *P. flavirostris* and for comparison with our findings, we collected photographs and videos available on the citizen-science platforms WikiAves ([www.wikiaves.com.br](http://www.wikiaves.com.br)) and Macaulay Library ([www.macaulaylibrary.org](http://www.macaulaylibrary.org)) up until 28 November 2024, along with relevant information from primary ornithological literature.

The nest was located within the recreation area of the reserve, a space embedded within a forest matrix. As well as single wood and brick buildings, this area comprised lawns and orchards with a mix of native species, including pitanga *Eugenia uniflora*, grumichama or grumixama *E. brasiliensis*, cambucá *Plinia edulis* and juçara *Euterpe edulis*, alongside exotic species such as pecan *Carya illinoensis* and kaki persimmon *Diospyros kaki*. The nest was situated in one of the orchards (28°39'12.29''S 49°37'52.14''W; 195 m elevation), c.30 m from the nearest building (Fig. 1). It was first found on 14 November 2024 by Délcio Binatti, a reserve staff member, who observed an adult incubating. On 17 November, Sidney José Damiani, the reserve owner, photographed both male and female participating in incubation (Fig. 2). The nest had a shallow, irregular cup shape<sup>18</sup>, constructed exclusively of lichenised fungi (thought to be *Usnea* sp., family Parmeliaceae), with no internal lining (Fig. 3). It was placed, fully exposed, in the fork of a horizontal branch, c.7 m above the ground, in a pecan tree. The tree measured 13 m in height and 72 cm in circumference at breast height.

The first detailed observations were carried out by the authors, João Paulo Durante and

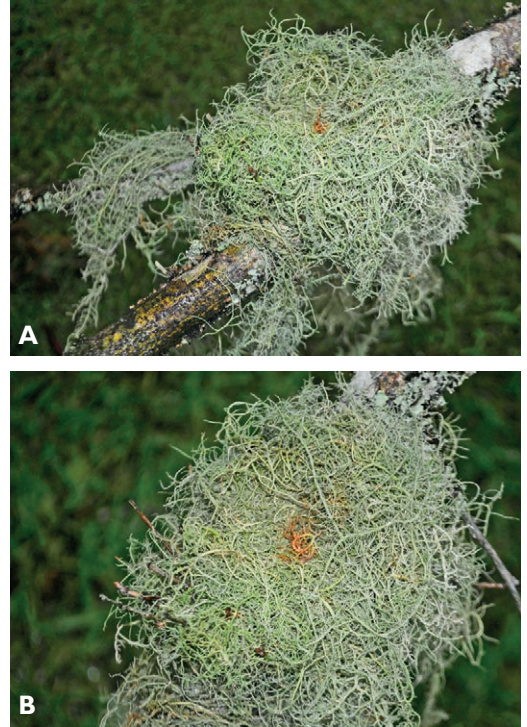


Figure 3. **A–B** Nest of Swallow-tailed Cotinga *Phibalura flavirostris* at Reserva São Francisco, Nova Veneza, Santa Catarina, Brazil, 22 November 2024 (João Paulo Gava-Just).

Rafael Spilere Romagna from 16h38–18h38 on 18 November 2024. During the observation, it was hot and humid, with continuous rain and temperatures of 25°C. Throughout the 2-h monitoring period, the male was mostly static, incubating (Fig. 4), moving occasionally to preen or switch position. On two occasions, he reacted in response to disturbance. First, he raised the head in apparent response to the engine noise of our vehicle as we arrived at the observation area. In the second instance he also raised the head, spooked, after the passage of a noisy group of four Tropical Kingbird *Tyrannus melancholicus* very close to the nest. A female was observed only once within the 2-hour observation period, flying distantly near the forested slope. However, we could not determine whether it was the nesting female.

On 19 November 2024, JPGJ performed detailed observations from 07h15–09h15, a period of heavy clouds and continuous rain, with the temperature 21°C. At 07h15, the male was incubating, briefly adjusting the outer structure of the nest with his bill, but remaining predominantly still, with occasional head movements. At 08h03, the first changeover occurred when the female assumed incubation shortly after landing. During her time at the nest, until 09h06, the female



Figure 4. Adult male Swallow-tailed Cotinga *Phibalura flavirostris* incubating at Reserva São Francisco, Nova Veneza, Santa Catarina, Brazil, 18 November 2024 (João Paulo Durante).

frequently adjusted her posture. At that time, another changeover occurred: the male returned, perched on a branch above the nest and resumed motionless incubation until observations ended. In total, the male incubated for 57 minutes, the female for 63 minutes. The changeovers were quick and discreet, with the female landing beside the nest, allowing the male to rise and leave without visible or vocal interaction. Both individuals were observed rearranging their ventral feathers, possibly to optimise brooding; they also used their bill to adjust the nest.

Field visits were not possible on 20–21 November 2024. However, monitoring was indirectly performed by Sidney José Damiani and Délcio Binatti. During this period, which included two days of continuous rainfall, no signs of adult activity near the nest were recorded. The lack of breeding activity observations raised suspicions of possible nest abandonment.

The authors monitored the nest from 18h00–18h30 on 22 November 2024, during constant rain with a temperature of 18°C. In the morning (D. Binatti pers. comm.), the species was not observed in the vicinity of the nest. Thus, three consecutive days passed without the presence of

adults at the nest. At this point, a ladder was used to access then inspect the nest, which was found empty, with neither egg remains nor signs of adult activity (Fig. 3). The nest consisted exclusively of lichens of the genus *Usnea*, as previously suspected from observations and photographs. Neither eggshell fragments nor intact eggs were found on the ground, suggesting the possibility of nest depredation. As of 8 December 2024, reserve staff members did not report any further sightings of *P. flavirostris* in the area.

## Discussion

The data we gathered from our nest aligns well with existing knowledge of the Atlantic Forest subspecies<sup>13</sup>. The nest structure we document, composed entirely of lichens, fits the low-cup/fork category of Simon & Pacheco<sup>18</sup>. Lichens are widely used as nesting material by various bird species in southern Brazil<sup>11</sup>, but *P. flavirostris* appears to be among the most specialised in their use. Regarding nest height, our findings fall within the documented range for the subspecies: 2–18 m above ground<sup>13</sup>. This contrasts with *P. f. boliviana*, which has been observed nesting on the ground<sup>2</sup>. Further, our data confirm that both sexes participate in

incubation, as previously suggested for both Atlantic Forest and Bolivian subspecies<sup>3,13</sup>. Male and female alternated incubation shifts, although we could not determine which sex spent more time incubating.

Nest abandonment for unknown reasons is not surprising. In Bolivia, the breeding success of *P. f. boliviana* is low, with an overall survival rate of 20% from incubation to fledging<sup>3</sup>; depredation was identified as the primary cause of nest failure. The Reserva São Francisco, where our nest was found, harbours a wide diversity of potential nest predators, including: arboreal mammals such as South American Coati *Nasua nasua*, Tayra *Eira barbara* and Southern Black-horned Capuchin *Sapajus cucullatus*; birds such as Red-breasted Toucan *Ramphastos dicolorus*, Squirrel Cuckoo *Piaya cayana* and raptors (Accipitridae and Falconidae); and snakes such as Tropical Chicken Snake *Spilotes pullatus*<sup>10,15</sup>. Further, comments accompanying online records in WikiAves and the Macaulay Library suggest multiple instances of unsuccessful breeding due to predation in Brazil, indicating that *P. f. flavirostris* likely also has low breeding success. The possibility that the nest was abandoned due to adverse weather conditions, such as heavy rain and strong winds, as has been observed in Bolivia<sup>3</sup>, cannot be ruled out, although this does not directly explain the absence of eggs when we checked the nest. Continuous rainfall persisted throughout most of our observation period. Overall, hypotheses regarding nest failure in *P. f. flavirostris* require further investigation through robust field studies, like those conducted in Bolivia.

In Santa Catarina, eight photographs of nests and nestlings from a breeding event during 2020 were reported along the Rio Itajaí-Açu in Itaiópolis and Santa Terezinha<sup>14</sup> (WikiAves: WA4098191, WA3647359), providing the first known evidence of breeding for the species in this state. However, no further records of continuous breeding activity in this area have emerged in subsequent years. Thus, the nest we describe represents only the second confirmed breeding record of *P. flavirostris* in Santa Catarina.

Moreover, this study also represents the first documented occurrence of *P. flavirostris* within the Important Bird and Biodiversity Area (IBA) Região dos Aparados da Serra<sup>5</sup>, which includes the Reserva São Francisco. Despite extensive ornithological surveys conducted in the reserve and its surroundings over the past decade, the species was not recorded<sup>9,10</sup>. Notably, the first record of the species in this area concerns a breeding attempt, which might imply temporarily favourable environmental conditions, such as resource abundance or other factors that enhance reproduction at a given time and place<sup>17,20</sup>. A similar

pattern has been documented in another cotingid, Red-ruffed Fruitcrow *Pyroderus scutatus*, which exhibited opportunistic breeding near an urban area in southeastern Brazil where it had not been previously recorded<sup>16</sup>. Considering that both breeding events in Santa Catarina (those along the Rio Itajaí-Açu and ours) appear to be sporadic and isolated, an important question arises: is the species merely an opportunistic breeder or an overlooked regular breeder in Santa Catarina? This question warrants further investigation.

### Acknowledgements

We thank and dedicate this study to the team of Reserva São Francisco, on behalf of the owner Sidney José Damiani and the collaborator Délcio Binatti, for notifying us about the occurrence of the species in the area, for allowing the study to take place, for assisting in data collection and for their exemplary effort in conserving the Atlantic Forest in Santa Catarina. We also thank the birdwatchers Rafael Spilere Romagna and João Paulo Durante for their company and assistance during fieldwork. The latter also provided a photograph that illustrated the study. Finally, we would like to express our gratitude to two anonymous reviewers for valuable contributions that significantly improved this manuscript.

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