

Natural history notes and breeding of the Pale Baywing (*Agelaioides fringillarius*) in northern Minas Gerais, Brazil.

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ABSTRACT: In Brazil the Pale Baywing is regarded as an endemic species of the Caatinga biome (Pacheco 2000). We present data on habitat, foraging and breeding of the Pale Baywing (*Agelaioides fringillarius*) obtained between 2001 and 2005 at Francisco Sá, Minas Gerais. We document the occurrence of cooperative breeding, and its host-parasite interactions with Shiny (*M. bonariensis*) and Screaming Cowbirds (*Molothrus rufoaxillaris*), the last a recent invader in this area. Nests (N = 18) were detected from December to February, during the rainy season. Most nests (N = 12) were placed within domed twig nests built by three furnariid species, and 5 nests were built within the crowns of palm trees. Six nests containing nestlings had from 4 to 6 attending Pale Baywings that brought food and mobbed or attacked avian predators or nest pirates. Two nests contained feathered Shiny Cowbird (*M. bonariensis*) chicks. Screaming Cowbirds were first seen in Francisco Sá in 1993, but up to 2005 all Screaming Cowbirds chicks were observed in nests of Chopi Blackbirds (*Gnorimopsar chopi*), or were flocking and roosting with this host.

KEY WORDS: Pale Baywing, *Agelaioides fringillarius*, natural history, nesting, cooperative breeding, brood parasitism, *Molothrus rufoaxillaris*, *M. bonariensis*.

INTRODUCTION

The Pale Baywing was described as *Icterus fringillarius* by Spix in 1824 from Minas Gerais, Brazil. Up to Friedmann's classical monograph (1929) it was treated as a full species (*Agelaioides fringillarius*). Jaramillo and Burke (1999) suggested that Pale Baywings could deserve specific status. The official Brazilian checklist (CBRO 2011) recognizes this form as a species, which is regarded as an endemic species of the Caatinga biome (Pacheco 2000).

Abundant information on the natural history and nesting behavior is available for the Grayish Baywing (*Agelaioides badius*), an icterid with cooperative breeding and subject to brood parasitism by two parasitic cowbirds (e.g. Friedmann 1929, De Marsico *et al.* 2012, Fraga 1986, 1998, 2011, Lowther 2013, Mason 1980). By contrast, only a minimum of natural history data and nesting information is available for the Pale Baywing. Ihering (1914) provided information on a single Pale Baywing nest, found in Barra, state of Bahia. A summary of the scant nesting information for Pale Baywings (Friedmann 1929, Jaramillo and Burke 1999) indicate the use of abandoned

nests of furnariids, absence of cooperative breeding, and rare parasitism by Shiny Cowbirds (*Molothrus bonariensis*).

We present here new information on the natural history and breeding behavior of the Pale Baywing obtained in Minas Gerais, northeastern Brazil. We include data on habitat use, foraging, nesting sites, cooperative breeding and interactions with brood parasites and nest predators. We paid special attention to interactions with Screaming Cowbird (*Molothrus rufoaxillaris*) a parasitic species that invaded this area in 1993 (D'Angelo Neto 2000) and is spreading further north in northeastern Brazil (Fraga 2011). As Grayish Baywings are the main Screaming Cowbird host in Argentina (Friedmann 1929, De Marsico *et al.* 2012, Fraga 1986, 1998, 2011, Lowther 2013, Mason 1980) it was suspected that Pale Baywings could also become hosts of this cowbird (Kirwan *et al.* 2001).

METHODS

The study area was centered in the rural town of Francisco Sá, Minas Gerais state, Brazil (16°29'S, 43°30'W; altitude

630 m). R. Fraga studied the Pale Baywings during two field trips (9 to 19 July 2001, and 28 December 2001 to 6 January 2002). S. D'Angelo Neto studied the species between January 2001 and March 2005.

Pale Baywings were found in an area of 120 km² around Francisco Sá at several *fazendas* (rural properties) with altitudes of 600 to 690 m; important information was obtained at Fazenda Baixo da Lasca (16°22'S, 43°33'W). The local climate was classified as "semiarid tropical" (Nimer 1989) with a mean annual temperature of 23° C. Annual rainfall averages 976 mm, with a severe dry season that lasts six months (April to September).

The landscape around Francisco Sá was hilly, and the original vegetation in the more humid lower bottoms was usually replaced with cattle pastures and some irrigated fields, divided by hedges of low native trees and shrubs (e.g. joazeiro *Zyziphus joazeiro*, *Celtis* sp.). Streams and marshes were mostly seasonal. A few remaining forest patches in the *fazendas* included tree species like *Astronium fraxinifolium*, *Myracrodruon urundeuva*, *Anadenanthera colubrina*, *Acacia polyphylla*, *Amburana cearensis* and *Schinopsis brasiliensis*. More xeric deciduous woodland and scrub occurred in rocky hilltops. The town and the larger *fazendas* had introduced trees and orchards of fruit trees like papaya, citrics, goiaba and mango.

Study areas for Grayish Baywings in Argentina (1977-1979) are described in Fraga (1986, 1998).

Field observations were carried with 8 x 10 binoculars. Bird behavior and vocalizations were monitored with a Sony Walkman Professional cassette recorder with an AKG C568 shotgun microphone. Nests in the "nestling stage" are those that contained nestlings (seen or heard) or those where we saw adult Pale Baywings carrying food. Observation times for nests ranged from 1 to 6 h, in most successful nests observation times were spread along three days.

RESULTS

Habitat use, roosting, foraging, and group sizes

Pale Baywings were mostly found in human-modified environments. They were abundant and even nested in Francisco Sá, using *praças*, street trees, orchards and gardens. In the *fazendas* they were one of the most common passerines.

Pale Baywings roosted only in trees. During the study we counted from 14 to 64 individuals roosting in street trees at Francisco Sá, often in company of House Sparrows (*Passer domesticus*) and less frequently Shiny Cowbirds (*Molothrus bonariensis*), Screaming Cowbirds, and Picui (*Columbina picui*) and Ruddy Ground Doves (*C. talpacoti*). Contrasting with roosting Grayish Baywings, group singing was rare in Pale Baywings, with

a maximum of 2-3 individuals producing brief songs. Around dawn, groups of Pale Baywings commuted to open fields elsewhere.

The largest group size of foraging Pale Baywings consisted of about 70 individuals, feeding in an empty corral. Elsewhere foraging groups ranged from two to 43 individuals. Most foraging was done on the ground, in weedy fields, pastures or stubble. In the non-breeding season Pale Baywings were largely comensal with rural people, feeding on spilled seeds and domestic refuse around houses, barns, poultry yards and corrals. We saw Pale Baywings feeding on cultivated seeds (maize, sorghum) or chicken food, rarely picking arthropods. A small group fed on exudates of Homoptera, and other tried to capture a small *Tropidurus* lizard. Pale Baywings did not follow grazing livestock. In the dry season the more abundant Chestnut-capped Blackbird (*Chrysomys ruficapillus*) frequently associated with foraging Pale Baywings in the *fazendas*. Shiny Cowbirds were less common associates. In fewer cases we saw the ground doves, Saffron Finches (*Sicalis flaveola*), Red-cowled Cardinals (*Paroaria dominicana*), Screaming Cowbirds and Chopi Blackbirds (*Gnorimopsar chopi*) near Pale Baywing groups.

Breeding

We detected nests (N = 18) from December to February, during the rainy season. J. Minns (pers. comm.) observed a case of nest building during the early rainy season (2 October 2002) at Januaria, Minas Gerais. Most nests (N = 12) were placed within domed nests of twigs built by three species of furnariids: Rufous-fronted Thornbird (*Phacellodomus rufifrons*), Caatinga Cacholote (*Pseudoseisura cristata*) and Chotoy Spinetail (*Schoeniophylax phryganophila*). One nest was found within a nest of Great Kiskadees (*Pitangus sulphuratus*) in the main *praça* of Francisco Sá. Five nests were built within the crowns of the palm trees *Cocos nucifera* (N = 4) and *Roystonea regia*, this last one in the town of Francisco Sá. We did not observe Pale Baywings using the mud nests of Rufous Horneros (*Furnarius rufus*), although some were available.

Domed twig nests of furnariids were abundant in the study area, in the case of the thornbird up to five nests could be found in a single tree. All Pale Baywing nests were solitary, more than 200 m from each other. Nest heights ranged from 3.5 to 11 m, and only two could be inspected. Pale Baywing nests in palms were built at the base of fronds, the one in *Roystonea* partially hidden by a flowering spathe.

We have data on numbers of visiting Pale Baywing adults only for nine nests, including six that reached the nestling stage. One baywing nest in a low thornbird nest was found before egg-laying and contained an empty,

loose cup of grasses. Only two adults visited this site and scolded during our inspections. On a next visit this nest had no eggs and appeared abandoned. Three adults visited an inaccessible cacholote nest. Incubation had started in a second inaccessible cacholote nest, with one individual remaining inside for up to 45 min. It was visited by up to four individuals. All nests that reached the nestling stage were visited by 4 to 6 adults that brought food, carried fecal sacs and defended the nests. Six individuals provisioned 15 food items to a 9 m high thornbird nest in *Schinopsis* observed during 4 h on 28 December 2001. Identifiable items brought to nestlings were mostly insects and spiders, and rarely pieces of small lizards or amphibians. On 4 January 2002, three nestlings were leaving this nest and 8 Pale Baywing adults were noisily vocalizing within 5 m of it.

Pale Baywing nesting groups were seen noisily attacking and mobbing five bird species. Once a Harris Hawk (*Parabuteo unicinctus*) successfully carried feathered nestlings although it was attacked and pursued by five Pale Batwings. Guira Cuckoos (*Guira guira*) were successfully evicted around nests four times, and Cattle Tyrants (*Machetornis rixosus*) twice. The most striking and successful case of nest defense occurred on 28 December 2012 in a thornbird nest at Baixo da Lasca twice attacked in 4 h by a pair of Campo Troupials (*Icterus jamacaii*). Four of the six Pale Baywings chased and mobbed the troupials while two perched blocking the nest entrance. In a similar case two Catinga Cacholotes that perched within 10 m of one Pale Baywing nest were mobbed and chased while other individuals remained as sentinels near the nest. All the attacked species were nest predators, nest pirates or nest competitors (Pinto 1967, Remsen 2003).

In December-February we saw Pale Baywing groups of 2-8 adults plus food-dependent fledglings. Some of those post-nesting groups foraged in the thorny woodlands on the rocky hilltops, which were seldom visited during the dry season. In two *fazendas* juveniles with pinkish mouths were following adults as late as 10-12 July, but their gaping behavior and begging calls did not elicit feeding. However, Roadside Hawks (*Buteo magnirostris*) that perched within 20 m from two juveniles were mobbed and chased by 3-4 adults.

Brood parasitism by cowbirds

The two nests within the town of Francisco Sá contained single feathered Shiny Cowbird chicks, both with dusky black plumage, plus host chicks. Female and juvenile plumages are similar in Shiny Cowbird populations (Fraga 2011) and most Shiny Cowbird females seen in the study area belonged to this dusky black *melanogyna* morph. One Shiny Cowbird chick fledged from the *Pitangus* nest on 5 January 2002. The next day we also observed two recently fledged host chicks at the same site. Many adults

brought food to the host chicks during 3 h of observation, but the parasite chick was ignored. The fate of the Shiny Cowbird chick in the *Rostoynea* nest remains unknown, as the nest was deserted in our next visit.

No visits of Screaming Cowbirds to Pale Baywing nests were observed during the 2001-2004 breeding seasons. Only once we saw an interaction between breeding Pale Baywings and Screaming Cowbirds. On 29 December 2005, two Pale Baywings chased a Screaming Cowbird pair near a thornbird nest, while two more baywings perched at the nest entrance. We did not observe in our post-breeding Pale Baywing groups the diagnostic black-blotched plumage of molting Screaming Cowbird fledglings.

Breeding Chopi Blackbirds around Francisco Sá used palm crowns and nests of thornbirds and horneros, thus partially overlapping in site use with Pale Baywings. The first case of Screaming Cowbird parasitism at Francisco Sá was observed on 23 December 1993 when a Chopi Blackbird nest in a tree hole 4 m high contained two parasite chicks plus one host nestling. In 2001-2005 we observed adults, juveniles and fledglings of Screaming Cowbirds mostly at Fazenda Baixo de Lasca. Adults occurred in groups of one to four pairs or (once) a single displaying and singing male. Screaming Cowbirds flocked with Chopi Blackbirds at this *fazenda* and shared roost sites with them. Around those roosts we saw five Screaming Cowbird fledglings (some molting into black plumage) being fed and guarded by adult Chopi Blackbirds.

DISCUSSION

Pale Baywings resembled Grayish Baywings in using mostly human-modified habitats and in consuming an opportunistic mixture of seeds and animal food. Rarer plant foods in the diet of Grayish Baywings (fruits and nectar, Fraga 2011) could be used by Pale Baywings as well. Gregarious roosting, foraging behavior and group sizes are comparable in both forms. The breeding season of Pale Baywings at Francisco Sá presumably extends to the end of the rainy season in March.

Furnariids provided most nest sites for Pale Baywings, as with most reports for Grayish Baywings from Argentina (e.g. Hoy and Ottow 1968, Di Giacomo 2005). In another study from Argentina (Fraga 1988) Grayish Baywing nest sites were more diversified, including holes in trees and clumps of epiphytic bromeliads, not observed in our small Pale Baywing sample. Most studies of Grayish Baywings from Argentina do not mention nests in palm trees (e. g. Hoy and Ottow 1968, Di Giacomo 2005) and only 4 of 161 nests in Fraga (1988) were built in the base of palm fronds. Pale Baywings seem to nest in palm trees more frequently than Grayish Baywings in Argentina. Nests built within the crowns of palm trees

are reported for a small number of Neotropical icterids, particularly Chopi Blackbirds, Cuban Blackbirds (*Dives atrovioleacea*) and the Puerto Rican Yellow-shouldered Blackbird (*Agelaius xanthomus*) (Fraga 2011).

Our data shows that Pale Baywings are cooperative breeders, with more than two individuals sharing parental duties at every nest that reached the nestling stage, sometimes even before. We saw higher numbers of helpers per nest than in Argentinian Grayish Baywings (Fraga 1991). More information is needed on the age, sex and degree of kinship of the helpers.

We confirmed parasitism of Pale Baywings by Shiny Cowbirds. On the other hand, twelve years after the arrival of Screaming Cowbirds in Francisco Sá we could not find solid evidence that they were effectively parasitizing Pale Baywings. We cannot predict if a host-parasite interaction will evolve in the future. Although Screaming Cowbird nestlings resemble those of Pale Baywings in plumage and calls, aggressive and coordinated nest guarding by Pale Baywing groups may be a deterrent to this newly arrived brood parasite. Our data shows that Chopi Blackbirds played a main role during the remarkable range expansion of Screaming Cowbirds in northeastern Brazil.

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