



## OCCURRENCE AND DIET OF THE THREATENED WHITE-WINGED COTINGA *XIPHOLENA ATROPURPUREA* IN THE NORTHERN ATLANTIC FOREST, BRAZIL

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**Abstract** · The White-winged Cotinga *Xipholena atropurpurea* is a threatened species endemic to the Brazilian Atlantic Forest, with a restricted distribution in a few forest fragments. In this study, we report the discovery from field surveys of a new occurrence site for the species, after nearly 10 years since its last record in Paraíba, Brazil. We also collected occurrence, vegetation type, and dietary data from records in citizen science platforms, and modeled density of species records across its distribution. Our results revealed a density of occurrence records in areas where the species had previously been considered probably extirpated. We found more records in open ombrophilous forests and records of fruit consumption predominantly from the Araliaceae family. Our results provide insights into the species' current distribution in the Pernambuco Endemism Center region. We recommend establishing conservation units in the newly identified occurrence site, requiring monitoring and additional studies to aid future conservation efforts.

### Ocorrência e dieta do ameaçado Anambé-de-asa-branca *Xipholena atropurpurea* no norte da Mata Atlântica, Brasil

**Resumo** · O Anambé-de-asa-branca *Xipholena atropurpurea* é uma espécie ameaçada de extinção endêmica da Mata Atlântica brasileira, com distribuição restrita a alguns fragmentos florestais. Neste estudo, relatamos a descoberta de uma nova localidade de ocorrência da espécie, quase 10 anos após seu último registro na Paraíba. Também coletamos dados de ocorrência, tipo de vegetação e dieta a partir de registros em plataformas de ciência cidadã e modelamos a densidade de registros da espécie nos locais. Nossos resultados revelaram uma densidade de registros de ocorrência em áreas onde a espécie havia sido considerada provavelmente extinta. Encontramos mais registros em florestas ombrófilas abertas e registros de consumo de frutos predominantemente da família Araliaceae. Nossos resultados fornecem informações sobre a distribuição atual da espécie na região do Centro de Endemismo de Pernambuco. Recomendamos o estabelecimento de unidades de conservação na nova localidade de ocorrência, demandando monitoramento e estudos adicionais para apoiar futuras ações de conservação.

**Key words:** Conservation · Cotingidae · Distribution · Frugivory · Habitat use · Pernambuco Endemism Center

### INTRODUCTION

The White-winged Cotinga *Xipholena atropurpurea* is a threatened and still poorly known species, endemic to the Brazilian Atlantic Forest, and considered one of the rarest cotingas (Teixeira and de Almeida 1997). The species currently persists only in a few isolated forest remnants as much of its habitat has already been destroyed (CEMAVE 2018). Despite its conservation relevance, fundamental information on the species' current distribution, occurrence patterns, and basic ecological aspects remains scarce.

The Atlantic Forest inhabited by the White-winged Cotinga is recognized as one of the most threatened global biodiversity hotspots, and the most degraded and fragmented phytogeographic domain in Brazil (Myers et al. 2000). Within this domain, the White-winged Cotinga is found in coastal forests stretching between Paraíba and Rio de Janeiro (Sick 1997). According to Teixeira and de Almeida (1997), the species was recorded from 0 to 900 m elevation and inhabits dense ombrophilous forests, open ombrophilous forests, and seasonal semideciduous forests, with 57.9% of the records occurring in dense ombrophilous forests. The species is classified internationally as Vulnerable (BirdLife International 2017), and it is estimated that fewer than 10,000 mature individuals (MMA 2022) are confined to 13 protected areas (Snow and Sharpe 2020), with occurrences outside these areas being extremely rare. Furthermore, the status of the species is considered critical in the northern Atlantic Forest, above the São Francisco River (CEMAVE 2018).

The diet of the White-winged Cotinga consists of fruits, but can also include flowers and some insects (Snow and Sharpe 2020). The species was recorded feeding on 29 plant species belonging to 18 families, most of which are from the families Moraceae, Myrtaceae, and Lauraceae (Sick 1997, Teixeira and de Almeida 1997). The White-winged Cotinga consumes fruits ranging from 4 to 12 mm diameter that are generally swallowed whole, feeding primarily in the early morning or late afternoon, foraging by perching on branches adjacent to the fruits before consuming them (Teixeira and de Almeida 1997). The species has also been observed feeding on lepidopteran larvae and capturing orthopterans in flight (Teixeira and de Almeida 1997).

Most of the plant families recorded in the diet of the White-winged Cotinga include species classified under some degree of threat



(MMA 2022), primarily due to the exploitation of trees from these families for timber production. Continuous deforestation is the primary threat to the White-winged Cotinga, along with wildfires and illegal logging, with the species almost entirely restricted to protected areas (Snow and Sharpe 2020). Another major issue is that several protected areas where this species occurs are threatened by various anthropogenic impacts (Winkler et al. 2020).

Due to the scarcity of information and the rarity of the White-winged Cotinga, little is known about its biology and ecology. Thus, this study aimed to provide information on aspects related to occurrence of the White-winged Cotinga in the northern part of its distribution, and on the species' diet, thereby contributing data for future conservation efforts.

## METHODS

**Study area.** The region covered in our study included the Atlantic Forest north of the São Francisco River, covering the states of the Alagoas, Pernambuco, Paraíba, and Rio Grande do Norte, an area known as the Pernambuco Endemism Center (Pizo and Tonetti 2020). This region harbors a rich diversity of birds, many of which are related to species found in other areas of the Atlantic Forest south of the São Francisco River, as well as in the Amazon (Pizo and Tonetti 2020, Araujo et al. 2023, Bocalini et al. 2023). The history of fragmentation in the Pernambuco Endemism Center, driven by urban and agricultural expansion since colonial times, is among the most severe in the entire Atlantic Forest, and likely one of the most significant among tropical forests (Ribeiro et al. 2009, Almeida and Souza 2023). This makes the Pernambuco Endemism Center a biodiversity hotspot within another global hotspot (Atlantic Forest). To evaluate the distribution of the White-winged Cotinga in this region we compiled all documented records in the region, including newly obtained field observations.

**Field sampling.** We conducted field sampling in the Sucupira Torta Forest, located in the municipality of Santa Rita, Paraíba, Brazil (7°00'30.2"S, 35°05'39.7"W), situated in an area classified as experiencing high anthropogenic pressure (MMA 2000). The predominant vegetation at the site is seasonal semideciduous forest (IBGE 2004), with a mean annual temperature of approximately 25°C (Lima and Heckendorf 1985), and an average total annual rainfall of approximately 1,500 mm, with the rainy season occurring from April to July (Francisco and Santos 2017). The forest mosaic covers approximately 9,800 ha and is located approximately 10 km from the Engenho Gargaú Private Natural Heritage Reserve and 32 km from the Guaribas Biological Reserve. Threatened taxa in the Sucupira Torta Forest include the Pernambuco Foliole-gleaner *Automolus lammi*, Scalloped Antbird *Myrmoderus ruficauda*, East Amazonian Fire-eye *Pyriglena leuconota pernambucensis*, Golden-tailed Parrotlet *Touit surdus*, White-collared Kite *Leptodon forbesi*, Brown-winged Schiffornis *Schiffornis turdina intermedia*, Ceara Woodcreeper *Xiphorhynchus atlanticus*, Amazonian Plain-Xenops *Xenops genibarbis alagoanus*, White-throated Spadebill *Platyrinchus mystaceus niveigularis*, and Amazonian Motmot *Momotus momota marcovianus* (MMA 2022).

On 12 October 2023, we conducted a trail survey within the forest fragment to document the local birdlife. This comprised a single transect approximately 2 km in length, along pre-existing 1 m wide trails that were likely created by local hunters. We have since made frequent visits to the fragment to make further observations. The observation was not part of a systematic sampling protocol and is therefore characterized as an opportunistic record.

**Data collection.** We collected occurrence data for the White-winged Cotinga from various sources, including citizen science platforms (eBird, iNaturalist, Xeno-Canto, WikiAves), bio-

diversity data repositories (GBIF, speciesLink, VertNet, SALVE-ICMBio), as well as documents available online. Searches were conducted in December 2023, in a non-systematic manner through exploratory searches in academic databases, using exclusively the species' scientific name as the search term. We conducted literature searches on Google Scholar and various ornithological collections (National Museum of Natural History, Field Museum of Natural History, Museum of Zoology of the University of São Paulo, Fonoteca Neotropical "Jacques Veliard", American Museum of Natural History, Natural History Museum of Los Angeles County, and Museu Nacional - Federal University of Rio de Janeiro). Records with spatial or temporal inaccuracies were excluded, retaining only those with specified geographic coordinates and confirmed year of record. Some records classified as historical on the Brazilian government SALVE-ICMBio platform (<https://salve.icmbio.gov.br/>) had imprecise locations and uncertain dates. Therefore, we chose to disregard these questionable records. We obtained a total of ten articles on the White-winged Cotinga, of which only one addressed aspects of the species' diet.

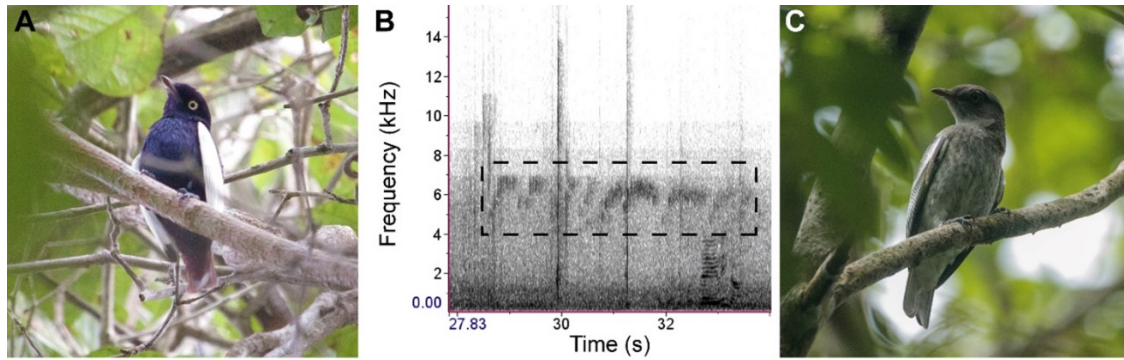
Additionally, we collected data on the plant species used by the White-winged Cotinga for fruit consumption, based on 58 photographic records obtained from the WikiAves platform and scientific literature. A botanical specialist analyzed the photographs to identify the plant taxa. We considered only images in which the birds were holding fruits in their beaks as dietary evidence. Images in which the birds were merely perched in the trees, without direct evidence of ingestion, were not considered feeding events. Finally, we sought information on protected areas from the Conservation Units in Brazil platform (<https://uc.socioambiental.org/>) and Private Natural Heritage Reserves (<https://sistemas.icmbio.gov.br/simrppn/publico/>) to evaluate the association of White-winged Cotinga occurrence records with the location of protected areas.

**Data analysis.** We projected the kernel density on the distribution map of the species using the heatmap (kernel density estimation) tool in QGIS 3.22.6 (QGIS Development Team 2024). For this analysis, we considered a radius of 10 km around the occurrence points to improve the visualization and spatial interpretation of the heat map and a resolution of 200 m. Kernel density outputs were interpreted as relative density values and not as percentages. Additionally, we calculated the frequency of records of the White-winged Cotinga in different types of vegetation (IBGE 2004) and the plant families used as food items.

## RESULTS

**New occurrence records in the study area.** We recorded a specimen of the White-winged Cotinga (Figure 1A–B) on 12 October 2023, along a trail in Sucupira Torta Forest (7°00'18.7"S, 35°04'13.2"W). We observed an individual at this site, starting at 08:57 h, for approximately 1 h and 20 mins. It was an adult male that performed short flights, the movements of which were audible due to the mechanical sound produced by the rapid beating of its wings. We also heard the vocalization of a second individual, which we could not visualize. We used a playback technique with the common vocalization of the species, and the observed individual approached but did not vocalize. During the observation, we made photographic (Figure 1A) and audio (Figure 1B) recordings of wingbeats.

Nearly seven months after our observation, there was a new sighting of the species (Figure 1C), this time of a female, shared on the citizen science platform WikiAves by Pedro Callado (WA6137710). This record occurred in the same forest fragment on 1 May 2024 (7°00'18.0"S, 35°04'04.8"W), approximately 250 m from our observation site. This record was kindly provided to us by Pedro Callado for this publication. On 19 October 2024, we again heard wingbeat sounds of the White-winged Cotinga at a nearby site (7°00'54.0"S, 35°04'27.3"W), al-



**Figure 1.** Field records of the White-winged Cotinga *Xipholena atropurpurea* in the Sucupira Torta Forest, Santa Rita, Paraíba, Brazil. (A) Photograph of a male at coordinates 7°00'18.7"S, 35°04'13.2"W (Photo credit: Alexandre Freire Martins, 12 October 2023). (B) Spectrogram of a male's wingbeat sound (dashed box) at coordinates 7°00'18.7"S, 35°04'13.2"W (Recording credit: Carlos Salustio-Gomes, 12 October 2023). (C) Photograph of a female at coordinates 7°00'18.0"S, 35°04'04.8"W (Photo credit: Pedro Callado, 1 May 2024).

though we were unable to visually confirm the individual.

**Species distribution in the study area.** Through our searches on citizen science platforms, biodiversity data repositories, and in literature, we obtained 87 occurrence records of the White-winged Cotinga between 1957 and 2024 in the Pernambuco Endemism Center (Table 1). The analysis of historical data showed the occurrence of the species in four fragments in Paraíba, eight in Pernambuco, and nine in Alagoas, totaling 21 fragments. The distribution of these records ranged from the municipality of Jequiá da Praia in southern Alagoas to the municipality of Mamanguape in northern Paraíba (Figure 2). The oldest records, before 2004, were concentrated in Alagoas and northern Paraíba (Figure 2). Recent records from the last 10 years (2014–2023) were distributed in all three states where the species occurs, however, in only seven fragments (Figure 2).

The highest Kernel density of occurrence records was observed in the forest landscape of Alagoas, specifically in the protected area of the Murici Ecological Station (Figure 3). However, at least half of the records showed a density of occurrence points in areas where the species was considered extinct (Figure 3) by the IUCN (BirdLife International 2017). There was a significant gap in records between southern Pernambuco and northern Paraíba (Figure 3). Considering the new records, a distance of 175 km separates the southernmost record in Paraíba and the northernmost record in Pernambuco. Most of the 10 km heatmap buffers of the White-winged Cotinga presence occurred within or close to one of six protected areas (Figure 3). However, we also obtained occurrence records in two areas lacking nearby protected areas (Figure 3).

We obtained records of the White-winged Cotinga in four types of vegetation: open ombrophilous forest (N = 56 records), dense ombrophilous forest (N = 13), seasonal semideciduous forest (N = 13), and seasonal forest (N = 5). The majority of records occurred in open ombrophilous forest (64.4%), whereas the other three vegetation types had less than 15% of records each. One of the records associated with dense ombrophilous forests was obtained in a restinga coastal sandbank vegetation (Portes et al. 2018) that is shaped by sea winds and marine conditions, ecologically linked to the Atlantic Forest, and particularly sensitive (Cerqueira 2000). This represents the first record in the literature of the species using restinga habitats within the Pernambuco Endemism Center.

**Diet.** Based on photographic records from WikiAves, and published literature (de Godoy and Piratelli 2021), we obtained 58 records of fruit consumption by the White-winged Cotinga. Of these, 30 records provided clear evidence of fruit consumption from 11 tree families (Figure 4). The greatest number of fruit consumption records were obtained for the Araliaceae family

(Figure 4), representing 31% (N = 16) of records, followed by Malpighiaceae (21%, N = 11 records), while Arecaceae and Moraceae had 6 records (12%) each.

## DISCUSSION

In this study, we provided new occurrence records of the White-winged Cotinga, and identified gaps in the species' spatial distribution within the Pernambuco Endemism Center in the Brazilian Atlantic Forest. The records were primarily concentrated in protected areas, suggesting a possible lack of monitoring in non-protected areas, which may compromise the accuracy of distribution knowledge based on secondary data. Most records were found in areas of open ombrophilous forest, indicating that this phytophysiognomy may be the most suitable for the species' persistence. Additionally, we found more records of specimens consuming fruits of the Araliaceae plant family, indicating the importance of this plant family as a food resource for the species; however, further research is needed to better understand the species' diet.

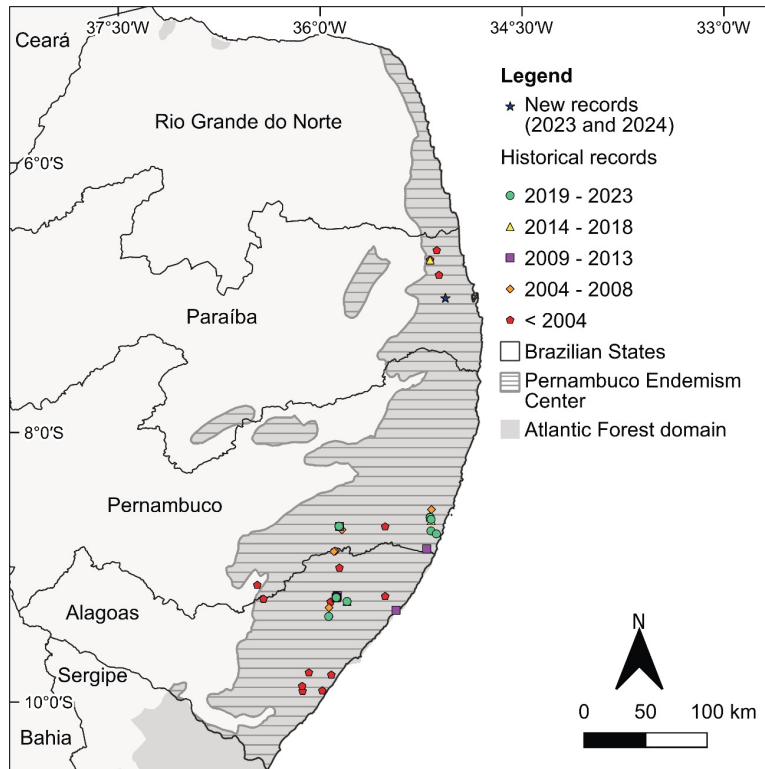
Our observation of the White-winged Cotinga in Santa Rita, Paraíba, in a part of its distribution where the species was presumed extinct (BirdLife International 2017), and where it had never been previously documented, suggests the existence of a previously unknown subpopulation. This may indicate that the Sucupira Torta Forest harbors a resident subpopulation of the White-winged Cotinga, highlighting the importance of expanding sampling efforts in adjacent areas with similar conditions to gather more data on the species' distribution. Our new record of the White-winged Cotinga, along with 10 other threatened species, underscore the importance of conserving the Sucupira Torta Forest, which is currently not protected. The Sucupira Torta Forest is one of the few remaining Atlantic Forest patches larger than 50 ha in the region, being larger than 80% of the Atlantic Forest fragments in the country (Ribeiro et al. 2009).

In the last 10 years, the situation has become even more concerning, with the species now recorded in only seven fragments in the Pernambuco Endemism Center. This pattern is consistent with the extensive habitat degradation documented across the Pernambuco Endemism Center, where many fragments have experienced progressive loss of forest structure and connectivity (Almeida and Souza 2023). The decline in the number of occupied fragments raises concerns about the persistence of local populations, and increasingly isolated remnants may limit the species' dispersal (Boscolo and Metzger 2011). These findings highlight the need for targeted conservation actions to maintain habitat quality and ensure the long-term viability of the remaining populations.

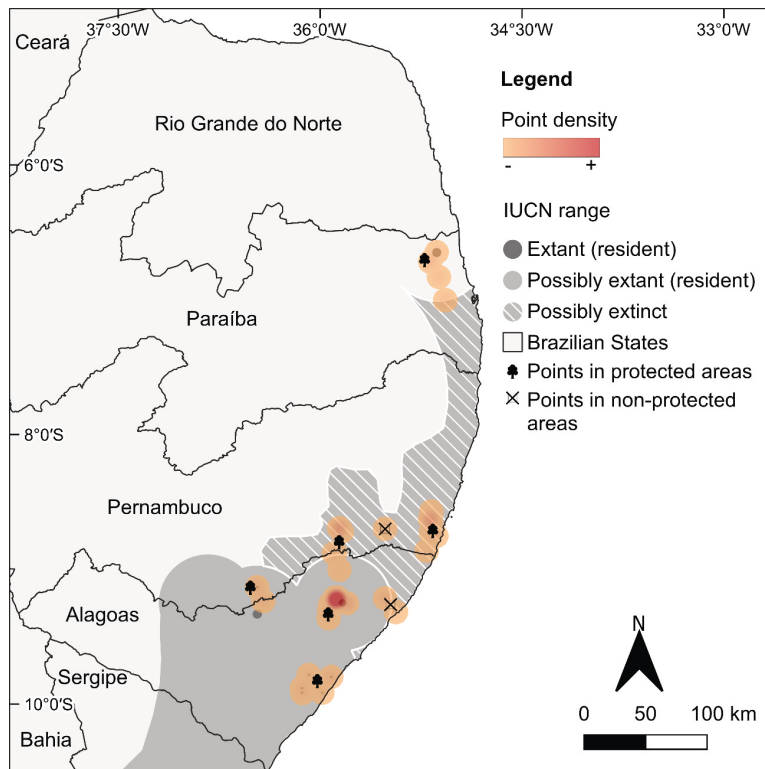
The concentration of records of the White-winged Cotinga

**Table 1.** Records of the White-winged Cotinga *Xipholena atropurpurea* in the Pernambuco Endemism Center, Brazilian Atlantic Forest between 1957 and 2024. NHM = Natural History Museum of Los Angeles County, MZUSP = Museum of Zoology of the University of São Paulo, PB = Paraíba, PE= Pernambuco, AL= Alagoas.

Database	Code	Record type	Date	Locality	Municipality, State
NHM	27033	Preserved specimen	03/16/1957	Usina Sinimbu	Jequiá da Praia, AL
MZUSP	39919	Preserved specimen	07/11/1957	Uruba	Mamanguape, PB
MZUSP	39921	Preserved specimen	07/14/1957	Uruba	Mamanguape, PB
MZUSP	39920	Preserved specimen	07/22/1957	Camaratuba	Mamanguape, PB
Teixeira and de Almeida 1997	–	Observation list	11/1983	Grota do Niquim	Marechal Deodoro, AL
Teixeira and de Almeida 1997	–	Observation list	11/1983	Grota do Azevedo	São Miguel dos Campos, AL
Teixeira and de Almeida 1997	–	Observation list	11/1983	Grota do Taboado	Jequiá da Praia, AL
Teixeira and de Almeida 1997	–	Observation list	11/1983	ESEC de Murici	Murici, AL
Teixeira and de Almeida 1997	–	Observation list	04/1984	Grota do Niquim	Marechal Deodoro, AL
Teixeira and de Almeida 1997	–	Observation list	01/1986	Usina Sinimbu	Jequiá da Praia, AL
Collar et al. 1992	–	Observation list	1986	–	Água Preta, PE
Teixeira and de Almeida 1997	–	Observation list	01/1987	–	Lagoa do Ouro, PE
Teixeira and de Almeida 1997	–	Observation list	02/1987	REBIO de Pedra Talhada	Quebrangulo, AL
Teixeira and de Almeida 1997	–	Observation list	01/1988	Fazenda Santa Justina	Passo de Camaragibe, AL
Teixeira and de Almeida 1997	–	Observation list	02/1988	–	Lagoa do Ouro, PE
Teixeira and de Almeida 1997	–	Observation list	1993	REBIO Guaribas	Mamanguape, PB
Teixeira and de Almeida 1997	–	Observation list	1994	REBIO Guaribas	Mamanguape, PB
Teixeira and de Almeida 1997	–	Observation list	08/1994	REBIO de Pedra Talhada	Quebrangulo, AL
Teixeira and de Almeida 1997	–	Observation list	08/1994	Fazenda Santa Justina	Passo de Camaragibe, AL
Teixeira and de Almeida 1997	–	Observation list	08/1994	ESEC de Murici	Murici, AL
eBird	OBS332939694	Observation list	10/04/1995	ESEC de Murici	Murici, AL
Roda et al. 2003	–	Observation list	07/22/2000	Mata do Engenho Coimbra	Ibateguara, AL
eBird	OBS471465233	Observation list	02/20/2003	ESEC de Murici	Murici, AL
eBird	OBS684755631	Observation list	04/18/2004	RPPN Frei Caneca	Jaqueira, PE
eBird	OBS684838129	Observation list	04/21/2004	Mata do Engenho Coimbra	Ibateguara, AL
eBird	S50588950	Observation list	04/21/2004	Mata do Engenho Coimbra	Ibateguara, AL
WikiAves	WA4175426	Sound	12/17/2006	Mata do Dêra	Sirinhaém, PE
xeno-canto	XC13823	Sound	06/14/2007	ESEC de Murici	Murici, AL
eBird	OBS712660772	Observation list	01/18/2008	ESEC de Murici	Murici, AL
Pereira 2009	–	Photo	06/13/2009	Fazenda Morim	São José da Coroa Grande, PE
xeno-canto	XC576072	Sound	04/25/2010	ESEC de Murici	Murici, AL
eBird	OBS1658985421	Observation list	04/25/2010	ESEC de Murici	Murici, AL
eBird	OBS402056116	Observation list	04/08/2011	ESEC de Murici	Murici, AL
eBird	S131223042	Observation list	04/25/2011	ESEC de Murici	Murici, AL
Portes et al. 2018	–	Photo	06/06/2011	Restinga area	Passo de Camaragibe, AL
eBird	OBS483358543	Observation list	11/18/2012	ESEC de Murici	Murici, AL
eBird	OBS451329931	Observation list	11/20/2012	ESEC de Murici	Murici, AL
xeno-canto	XC844089	Sound	11/22/2013	RPPN Pedra D'antas	Lagoa dos Gatos, PE
WikiAves	WA1404011	Photo	08/02/2014	REBIO Guaribas	Mamanguape, PB
eBird	OBS293540560	Observation list	01/17/2015	ESEC de Murici	Murici, AL
eBird	OBS375419142	Observation list	02/19/2016	Fazenda Trapiche	Rio Formoso, PE
eBird	OBS403967485	Observation list	05/14/2016	ESEC de Murici	Murici, AL
eBird	OBS611870500	Observation list	10/22/2016	ESEC de Murici	Murici, AL
eBird	OBS456632611	Observation list	01/11/2017	ESEC de Murici	Murici, AL
xeno-canto	XC525966	Sound	04/17/2017	ESEC de Murici	Murici, AL
xeno-canto	XC428157	Sound	06/14/2017	ESEC de Murici	Murici, AL
eBird	OBS512111673	Observation list	06/14/2017	ESEC de Murici	Murici, AL
eBird	OBS529261758	Observation list	08/31/2017	ESEC de Murici	Murici, AL
xeno-canto	XC586105	Sound	10/30/2017	ESEC de Murici	Murici, AL
xeno-canto	XC602797	Sound	11/05/2017	ESEC de Murici	Murici, AL
eBird	S40920969	Observation list	11/10/2017	Fazenda Trapiche	Rio Formoso, PE
eBird	OBS554798879	Observation list	11/15/2017	Fazenda Trapiche	Rio Formoso, PE
eBird	OBS559443350	Observation list	12/21/2017	ESEC de Murici	Murici, AL
eBird	OBS583214938	Observation list	01/18/2018	ESEC de Murici	Murici, AL
eBird	OBS676751452	Observation list	10/17/2018	ESEC de Murici	Murici, AL
eBird	OBS706350477	Observation list	01/19/2019	Fazenda Trapiche	Rio Formoso, PE
eBird	OBS748097443	Observation list	01/19/2019	REBIO Saltinho	Tamandaré, PE
eBird	OBS793223755	Observation list	01/25/2019	ESEC de Murici	Murici, AL
eBird	OBS715973927	Observation list	02/21/2019	ESEC de Murici	Murici, AL
eBird	OBS828668799	Observation list	11/08/2019	Fazenda Trapiche	Rio Formoso, PE
eBird	S62153753	Observation list	12/02/2019	ESEC de Murici	Murici, AL
eBird	OBS848890447	Observation list	01/08/2020	ESEC de Murici	Murici, AL
iNaturalist	101779557	Photo	01/10/2020	–	Murici, AL
eBird	OBS851743791	Observation list	01/15/2020	ESEC de Murici	Murici, AL
eBird	S63775953	Observation list	01/25/2020	Fazenda Trapiche	Rio Formoso, PE
eBird	S63759595	Observation list	01/25/2020	REBIO Saltinho	Tamandaré, PE
eBird	OBS876429701	Observation list	02/04/2020	ESEC de Murici	Murici, AL
WikiAves	WA3710983	Photo	02/29/2020	Fazenda Trapiche	Rio Formoso, PE
eBird	S65795108	Observation list	03/10/2020	RPPN Pedra D'Antas	Lagoa dos Gatos, PE
eBird	S99285372	Observation list	12/15/2020	ESEC de Murici	Murici, AL
eBird	OBS1034657632	Observation list	12/16/2021	ESEC de Murici	Murici, AL
eBird	S99285359	Observation list	12/19/2021	ESEC de Murici	Murici, AL
eBird	OBS1334474804	Observation list	01/26/2022	ESEC de Murici	Murici, AL
eBird	S102033290	Observation list	01/27/2022	ESEC de Murici	Murici, AL
eBird	S102033286	Observation list	01/28/2022	ESEC de Murici	Murici, AL
eBird	OBS1333047972	Observation list	02/01/2022	ESEC de Murici	Murici, AL
eBird	OBS1336837915	Observation list	02/06/2022	ESEC de Murici	Murici, AL
eBird	OBS1370931552	Observation list	03/20/2022	ESEC de Murici	Murici, AL
eBird	OBS1385074853	Observation list	04/06/2022	ESEC de Murici	Murici, AL
eBird	S122869925	Observation list	11/16/2022	ESEC de Murici	Murici, AL
eBird	S123292209	Observation list	11/19/2022	ESEC de Murici	Murici, AL
eBird	S122952666	Observation list	11/24/2022	RPPN Pedra D'Antas	Lagoa dos Gatos, PE
eBird	OBS1570502275	Observation list	11/25/2022	RPPN Pedra D'Antas	Lagoa dos Gatos, PE
eBird	S126231365	Observation list	12/22/2022	RPPN Pedra D'Antas	Lagoa dos Gatos, PE
eBird	S126907174	Observation list	01/25/2023	RPPN Pedra D'Antas	Lagoa dos Gatos, PE
This study	WA6529464; WA6529492	Photo and Sound	10/12/2023	Sucupira Torta Forest	Santa Rita, PB
WikiAves	WA6137710	Photo	05/01/2024	Sucupira Torta Forest	Santa Rita, PB



**Figure 2.** Historical records and new occurrence records of the White-winged Cotinga *Xipholena atropurpurea* in the Pernambuco Endemism Center, northeastern Brazil.

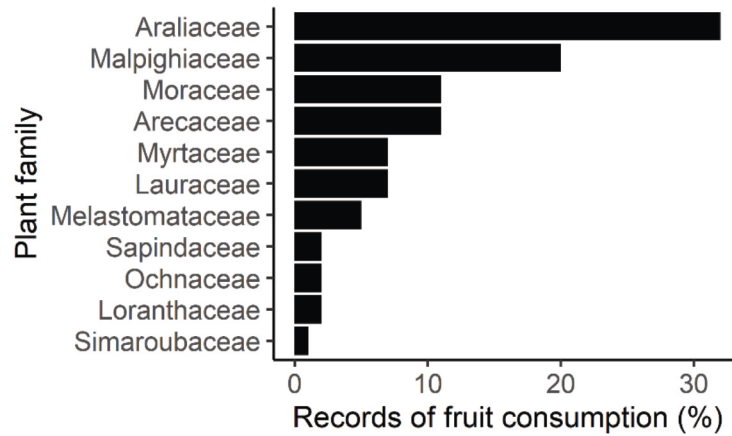


**Figure 3.** Kernel density of occurrence points for the White-winged Cotinga *Xipholena atropurpurea* in the Pernambuco Endemism Center, Brazil. Grey area shows extent of the species' distribution considered by IUCN (BirdLife International 2017), and tree symbols indicate the location of protected areas.

in or near protected areas may indicate that this species truly depends on conserved forests. Alternatively, there may be higher sampling effort in protected areas. However, we did not find research specifically focused on monitoring the White-winged Cotinga in forests of the Pernambuco Endemism Center. Therefore, we highlight the importance of conducting systematic stud-

ies in different forest landscapes to more accurately define the species' distribution areas.

The density of occurrence points determined in our study fall mainly within the spatial distribution of the White-winged Cotinga established by the IUCN (BirdLife International 2017).



**Figure 4.** Percent of photographic records from citizen science platforms indicating fruit consumption by the White-winged Cotinga, *Xipholena atropurpurea*, in 11 plant families.

However, we also found a density of locations of the species in areas where it is considered extinct (BirdLife International 2017). In these regions, careful monitoring could reveal new locations, particularly in ombrophilous forests, where more than half of the species records from this study and from other authors have been documented (Teixeira and de Almeida 1997).

Our results also revealed that the White-winged Cotinga occupies different vegetation types in forest habitats. However, we obtained more records of the species in open ombrophilous forests, while Teixeira and de Almeida (1997) recorded the species more frequently in dense ombrophilous forests. This suggests that the White-winged Cotinga finds more favorable conditions in these environments, possibly due to behavioral and ecological adaptations such as foraging strategies, resource availability, suitable nesting sites, and protection from predators (Snow and Sharpe 2020). Therefore, protecting and conserving ombrophilous forests is essential to ensure the persistence of the White-winged Cotinga in the Atlantic forest of Brazil.

However, we also obtained one record from the dense ombrophilous forest area that was confirmed to be within restinga coastal vegetation (Portes et al. 2018). This first documented record of the species in restinga environments within the Pernambuco Endemism Center, suggests that such habitat may function as refuges, foraging sites, or movement corridors for the species. The species has previously been documented in similar habitats in other regions (de Godoy and Piratelli 2021). Restingas are among the most endangered Brazilian coastal ecosystems, facing increasing pressure from intense land use driven by tourism and real estate speculation (Araujo 1997). This finding reinforces the importance of restinga for the conservation of threatened bird species, given that its functional integrity is intrinsically linked to the persistence of species that are sensitive to anthropogenic disturbances.

Most dietary records of White-winged Cotinga involved plant species belonging to the families Araliaceae and Malpighiaceae. This pattern contrasts with previous reports by Snow and Sharpe (2020), who emphasized Moraceae, Myrtaceae, and Lauraceae as the main components of the species' diet. In our study, the species was recorded consuming fruits from four plant families not reported by Teixeira and de Almeida (1997): Arecaceae, Sapindaceae, Loranthaceae, and Simaroubaceae. This expands our understanding of dietary diversification in White-winged Cotinga and highlights the importance of these botanical families in the species' diet, suggesting reliance on an alternative set of fruiting plants and underscoring the importance of regional studies for interpreting its trophic ecology.

The density of occurrence points of the White-winged

Cotinga outside protected areas raises concern, given that the Atlantic Forest has lost over 60% of its original coverage, exacerbating the situation for various species that depend on well-preserved environments, such as the White-winged Cotinga (Rezende et al. 2018). Hence, the creation of new protected areas is essential to increase the available area for the White-winged Cotinga and improve connectivity between habitat fragments (Possingham et al. 2006). Particular attention should be directed to the Pernambuco Endemism Center, as the conservation of its last remaining forest fragments is essential for the persistence of the White-winged Cotinga and other threatened and endemic taxa that rely on these increasingly fragmented and threatened habitats.

Our study provided new data on the current distribution, vegetation types used, and diet of the White-winged Cotinga, a species for which there is scarce ecological and biological information (Snow and Sharpe 2020). Occurrence of the White-winged Cotinga in the Sucupira Torta Forest may indicate a high-quality habitat, not only for this but also for other threatened species. In this context, it is crucial to strengthen the protection and management of all fragments of the region, not only in protected areas. This will ensure the effective implementation of management plans and enforcement against illegal activities. We also recommend the establishment of new protected areas, especially encompassing the Sucupira Torta forest fragment, to ensure preservation of the White-winged Cotinga subpopulation reported here, and of other threatened species in the area. We also suggest conducting comprehensive studies on the species distribution, considering factors such as landscape characteristics and climate change, to identify priority areas and anticipate potential new impacts on the species. Lastly, we highlight the importance of monitoring nests to assess reproductive success and the effectiveness of conservation measures. Finally, we hope this work encourages other researchers to develop further studies on the White-winged Cotinga, as this has been the first step towards better understanding the species' ecological requirements. Thus, with more information and continuous research, the species' risk of extinction may be mitigated.

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