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Inventory

Checklist of Odonata species from Serra of Itabaiana National Park, and an update and new records for the state of Sergipe, Brazil

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Abstract: Understanding species diversity and distribution cannot be overstated in the development of effective management and biological conservation strategies. Our goal was to address the knowledge gap regarding dragonfly diversity in the northeastern Atlantic Forest, specifically in the Serra of Itabaiana National Park in the state of Sergipe, Brazil. During our study, we recorded 40 species and 969 Odonata individuals across six families and 25 genera. This study contributes 27 new occurrence records of Odonata species in Sergipe, Brazil, highlighting the significance of preserving and protecting the habitats of this region. Our findings provide valuable information on the distribution of dragonfly species in the state of Sergipe and the Northeast region.
Keywords: *Atlantic Forest; Conservation; Dragonfly; Damselflies; Inventory.*

Checklist das espécies de Odonata do Parque Nacional da Serra de Itabaiana, e uma atualização e novos registros para o estado de Sergipe, Brasil

Resumo: A compreensão da diversidade e distribuição das espécies é fundamental para o desenvolvimento de estratégias efetivas de manejo e conservação biológica. Nosso objetivo foi abordar a lacuna de conhecimento sobre a diversidade de libélulas na Mata Atlântica nordestina, especificamente na Serra do Parque Nacional de Itabaiana, no estado de Sergipe, Brasil. Durante nosso estudo, registramos 40 espécies e 969 indivíduos de Odonata em seis famílias e 25 gêneros. Este estudo contribui com 27 novos registros de ocorrência de espécies de Odonata em Sergipe, Brasil, destacando a importância de preservar e proteger os habitats desta região. Nossos resultados fornecem informações valiosas sobre a distribuição das espécies de libélulas no estado de Sergipe e na região Nordeste.
Palavras-chave: *Mata Atlântica; Conservação; Libélulas; Donzelinhas; Inventário.*

Introduction

Odonates are widely distributed worldwide, with Antarctica as an exception (Von Ellenrieder 2009, Rodrigues & Roque 2017). They comprise 6,405 species (Paulson & Schorr 2024), which are mainly associated with freshwater ecosystems (Kalkman et al. 2008). Approximately 1,800 species are found in the Neotropical region (Von Ellenrieder 2009), and it is estimated that over 870 Odonata species and 152 genera of dragonflies are recorded in Brazil (IUCN 2024), with four families of Anisoptera and 11 families of Zygoptera (Hamada et al. 2014). Recent years have witnessed a significant upsurge in ecological studies centered on Odonata diversity in Brazil (Miguel et al. 2017, Koroiva et al. 2022). As a result, Brazil has emerged as one of the top contributors to the global corpus of Odonata-focused publications (Oliveira-Junior et al. 2022). However, this knowledge is distributed asymmetrically among Brazilian geographic regions, with the highest concentration of studies located mainly in the Southeast, North, and Midwest regions (Miguel et al. 2017, Koroiva et al. 2021). Knowledge in the Northeast region presented sporadic collections (De Marco-Júnior & Vianna 2005, Vianna & De Marco-Júnior 2012, Miguel

et al. 2017). However, in the last decade, emerging research groups have been consolidating and improving regional knowledge (Farias et al. 2023). A brief literature review revealed that Odonata inventory studies have been published in the following states: Ceará (Takiya et al. 2016), Sergipe (Santos et al. 2020), Bahia (Ribeiro et al. 2021a), Paraíba (Koroiva et al. 2021), and Alagoas (Godé & Ferreira-Peruquetti 2015, Farias et al. 2023). In addition, there are studies on occurrence records of species in other northeastern states (Mesquita & Matteo 1991, De Marco-Júnior 2008, Carvalho & Bravo 2014, Irusta & Lencioni 2015, Nobre 2016, Bastos et al. 2019, Lacerda & Machado 2019, Ribeiro et al. 2021b, Garcia-Junior et al. 2022, Koroiva et al. 2022).

Until a few years ago, Sergipe was a state that was largely unknown regarding its odonate fauna. Currently, Sergipe has 37 known dragonfly species, which is the result of rapid inventory and recent collection efforts (Machado 2015, Santos et al. 2020, Vilela et al. 2021a, b, 2022). Given this context, to minimize the asymmetry of knowledge regarding Odonata in Brazil and the Atlantic Forest, the objective of this study was to inventory dragonfly species in the Serra of Itabaiana National Park, addressing richness, abundance, diversity, and new records for the state of Sergipe. To our knowledge, there are few Odonata species inventory studies for federal conservation units in Brazil, such as the Biological Reserve of Pedra Talhada (Godé & Ferreira-Peruquetti 2015), Ubajara National Park, and Sete Cidades National Park (Takiya et al. 2016), Chico Mendes Extractive Reserve, and Cazumbá–Iracema Extractive Reserve (Filho et al. 2022). The Red List of Threatened Species in Brazil, which is maintained by Instituto Chico Mendes de Biodiversidade – ICMBio, was utilized to designate the conservation status of the species. Thus, our study is significant because it can contribute to the evaluation of the conservation status and distribution of Brazilian odonates.

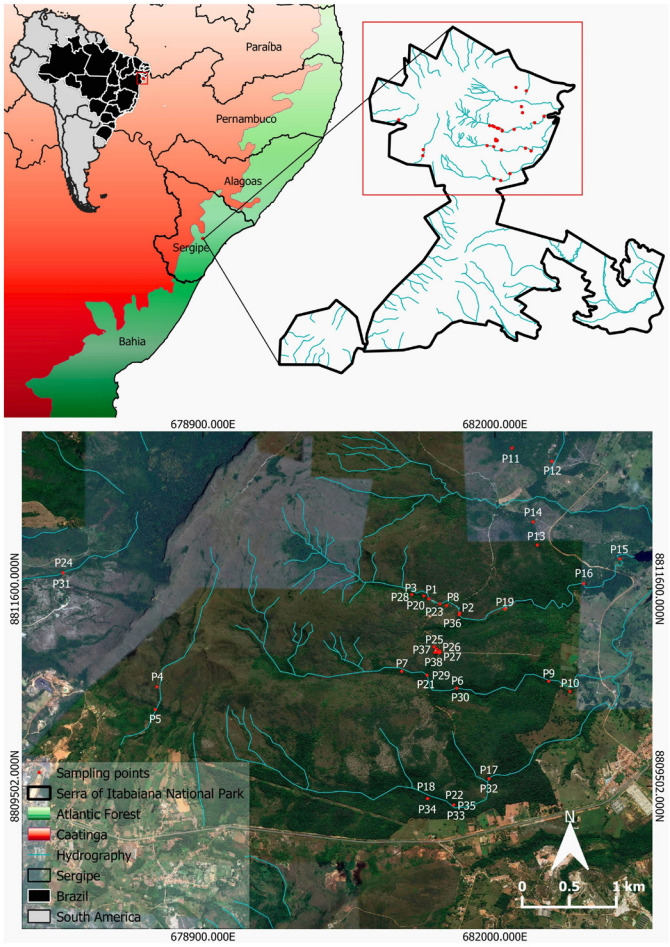

Figure 1. Sampling points for Odonata species in Serra of Itabaiana National Park, Sergipe, Brazil.

Material and Methods

1. *Study area*

The Serra of Itabaiana National Park (SINP) is composed of three mountain ranges (Serra of Itabaiana, Serra Comprida, and Serra of Cajueiro), covering an area of approximately 7,966 ha, distributed among the municipalities of Areia Branca, Itabaiana, Laranjeiras, Itaporanga D' ajuda, and Campo do Brito in the state of Sergipe, Brazil (Vicente et al. 2005, Silva et al. 2019) (Figure 1). SINP is a conservation unit with the characteristic biomes of the Atlantic Forest and Caatinga (Vicente et al. 2005, Silva et al. 2019). Additionally, the SINP is an important component of the hydrographic basin of the state of Sergipe (ICMBio 2016), represented by water bodies such as the Coqueiro, dos Negros, and Água Fria streams, all of which are associated with the remaining Atlantic Forest.

2. *Sampling*

Odonates were sampled between December 2020 and February 2021 on sunny days between 7:00 am and 4:00 pm. Only adult individuals were sampled using entomological nets by two collectors for 1 h at each sampling point along a 100 m transect. The sampling points were distributed in streams, waterfalls, pools, bromeliads phytotelmata, and around the ICMBio headquarters (Figure 2, Table 1). A total of 24 locations were systematically sampled, totaling a sampling effort of 48 h. Specimens collected during 14 sporadic events were also considered, as they added new records to the SINP. In these events, individuals were captured using an entomological net by only one collector for approximately 1 h, without walking a predetermined distance. Of the 14 sporadic events, only two occurred recently (September 23 and 25, 2022), while all others were from the same period as the standardized collections. The specimens were prepared in P.A. acetone, based on the methodology proposed by Lencioni (2005, 2017), placed in silk envelopes, and subsequently identified at the species level by Dr. Diogo Silva Vilela. All specimens were deposited in the Odonate Collection of the Ecology and Biodiversity Laboratory (LEBIO) of the Ecology Department at the Federal University of Sergipe (UFS), in São Cristóvão, Sergipe. Two specimens each of *Heteragrion lencionii* Vilela, Farias & Santos, 2021 and *Leptagrion itabaiana* Vilela, Lencioni & Santos, 2021 were deposited in the Frederico A. A. Lencioni Collection, Jacareí, São Paulo, Brazil (FAAL). The specimens were collected with the approval of Instituto Chico Mendes de Conservação da Biodiversidade – ICMBio (SISBIO #83369/1).

3. *Species distribution, conservation status and data analysis*

To gather information on the distribution of Odonata species in the state of Sergipe, we conducted a comprehensive search of online

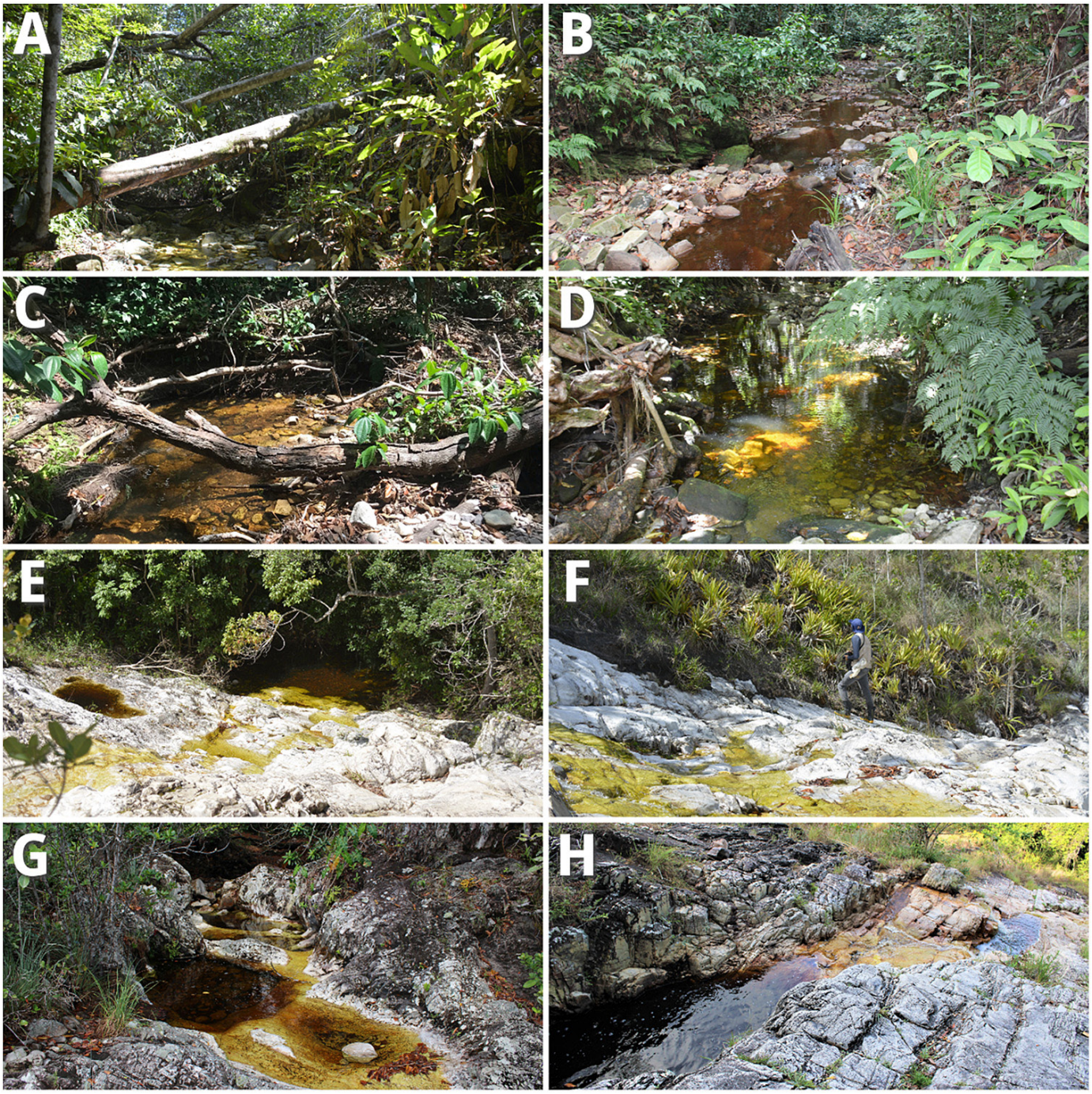

Figure 2. Sampling points for Odonata in Serra of Itabaiana National Park, Sergipe, Brazil: (A–D) streams in forests; (E-F) streams in open areas with small waterfalls; and (G-H) streams and pools in open areas. Photos: (A–H) J.C.S 2021.

academic databases, including the ISI Web of Knowledge, Google Scholar, Scielo, Scopus, and JStor. To optimize our search results, we employed a variety of keywords, such as "dragonflies", "odonates", "odonata", and "Sergipe", which were combined in various ways. As we were unable to identify any relevant publications in languages other than English and Portuguese, we conducted searches in both languages. We then selected all available publications, excluding unpublished studies, such as theses and dissertations. Thus, we compiled species distributions from the following literature: Calvert (1909), Belle (1988, 1992), Machado (2015), Santos et al. (2020); Vilela et al. (2021a, b), Vilela et al. (2022). A comprehensive list of all Odonata species occurring in Sergipe is presented in the results. Finally, to assess the conservation status of each species, we consulted the Red List of Threatened Species databases of ICMBio (ICMBio 2024) and the International Union for Conservation of Nature (IUCN 2024).

For this study, each sampling point was considered a sampling unit. To estimate species richness and measure the efficiency of the sampling effort, interpolation and extrapolation curves were

Table 1. Sampling points and their respective environmental information, dates, and geographic coordinates in the Serra of Itabaiana National Park, Sergipe, Brazil. Legend: A – Open area; B – Closed area with canopy; C – Waterfall; D – Stream; E – Pool; F – Lentic; G – Lotic; H – Semilotic; I – Shaded environment; J – Environment with high solar incidence; K – Small open areas with low solar incidence; L – Mixed environment with partially shaded open and closed areas; M – Anthropized environment; N – Artesian well; O – Bromeliaceae phytotelmata. Between P1 and P24, collections were standardized, and between P25 and P38, collections were sporadic. See Figure 1 for a clearer visual representation of the spatial arrangement of the sampling points.

Sampling points	Habitat	Sampling date	Geographic coordinates	
P1	A, C, D, G, H, J, L, M	25/I/2021	10°44'49.58"S	37°20'31.33"W
P2	B, D, G, H, K	25/I/2021	10°44'55.03"S	37°20'20.67"W
P3	B, D, G, H, I, M	25/I/2021	10°44'48.12"S	37°20'37.31"W
P4	A, E, F, H, J	26/I/2021	10°45'20.48"S	37°22'6.17"W
P5	B, C, D, G, I	26/I/2021	10°45'28.34"S	37°22'6.70"W
P6	B, D, G, H, I	26/I/2021	10°45'20.42"S	37°20'21.43"W
P7	B, D, G, H, I	26/I/2021	10°45'14.67"S	37°20'40.67"W
P8	B, D, G, H, L	01/II/2021	10°44'51.87"S	37°20'25.16"W
P9	B, D, G, I, M	01/II/2021	10°45'17.81"S	37°19'49.27"W
P10	B, D, G, H, K, M	01/II/2021	10°45'21.32"S	37°19'41.82"W
P11	B, D, G, L, M, N	01/II/2021	10°43'57.22"S	37°20'2.53"W
P12	B, D, G, K, M, N	01/II/2021	10°44'1.79"S	37°19'48.56"W
P13	B, C, D, G, I, K, M	02/II/2021	10°44'30.74"S	37°19'53.53"W
P14	B, D, G, H, I, K, M	02/II/2021	10°44'22.75"S	37°19'55.03"W
P15	A, D, G, J, M	02/II/2021	10°44'35.37"S	37°19'24.65"W
P16	B, D, G, K, M	02/II/2021	10°44'43.98"S	37°19'37.23"W
P17	B, D, G, H, I, K, M	03/II/2021	10°45'51.67"S	37°20'9.93"W
P18	B, D, G, K, M	03/II/2021	10°45'58.66"S	37°20'31.39"W
P19	A, C, D, G, H, L, M	07/XII/2020	10°44'54.78"S	37°20'7.30"W
P20	B, D, G, I, M	07/XII/2020	10°44'48.54"S	37°20'33.10"W
P21	B, D, G, H, K, M	07/XII/2020	10°45'15.98"S	37°20'31.82"W
P22	C, D, E, F, G, J, K	07/XII/2020	10°46'0.80"S	37°20'22.22"W
P23	B, D, G, H, I, M	13/XII/2020	10°44'51.28"S	37°20'27.41"W
P24	B, D, G, H, K, M	13/XII/2020	10°44'41.20"S	37°22'39.26"W
P25	A, F, J, M, O	03/II/2021	10°45'6.12"S	37°20'29.40"W
P26	A, F, J, M, O	03/II/2021	10°45'7.60"S	37°20'27.38"W
P27	ICMBio headquarters	07/XII/2020	10°45'7.60"S	37°20'27.38"W
P28	A, C, E, F, G, H, K	07/XII/2020	10°44'48.54"S	37°20'33.10"W
P29	B, C, E, H, I	07/XII/2020	10°45'15.98"S	37°20'31.82"W
P30	B, D, G, H, K, M	07/XII/2020	10°45'20.42"S	37°20'21.43"W
P31	B, D, G, H, K, M	13/XII/2020	10°44'41.20"S	37°22'39.26"W
P32	C, D, E, F, G, J, K	03/II/2021	10°45'51.67"S	37°20'9.93"W
P33	B, D, G, I	07/XII/2020	10°46'0.80"S	37°20'22.22"W
P34	C, D, E, F, G, J, K	03/II/2021	10°45'58.66"S	37°20'31.39"W
P35	B, D, G, I	07/XII/2020	10°46'0.80"S	37°20'22.22"W
P36	A, C, D, G, H, L, M	07/XII/2020	10°44'54.38"S	37°20'20.56"W
P37	A, F, J, M	25/IX/2022	10°45'6.94"S	37°20'28.50"W
P38	A, F, J, M	23/IX/2022	10°45'8.11"S	37°20'29.23"W

constructed for the total number of sampled points and suborders (Anisoptera and Zygoptera). The curves (Hill number q – 0) were based on specimen abundance and confidence intervals (95%) were determined from 1,000 bootstraps (Chao et al. 2014, Hsieh et al. 2016), with extrapolation estimated to be three times the number of specimens sampled (Chao et al. 2014). In addition, the distribution of species abundance was plotted to visually compare the total species dominance patterns. Interpolation and extrapolation curves were generated using the "iNEXT" package (Hsieh et al. 2020) and all analyses were performed using the "R" software version 4.2.2 (R Core Team 2022).

Results

This study recorded a total of 40 species and 969 individuals of Odonata in the SINP, distributed among the suborders Anisoptera and Zygoptera, six families, and 25 genera. Of these, 109 were from Anisoptera, and 860 were from Zygoptera. Libellulidae was the most diverse family, with 19 species, followed by Coenagrionidae with 12 species. The suborder Zygoptera had the highest abundance, with 89% of the collected individuals, with Coenagrionidae as the most representative family. The most abundant species were *Heteragrion aurantiacum* Selys, 1862, *Argia reclusa* Selys, 1865, and *A. smithiana*

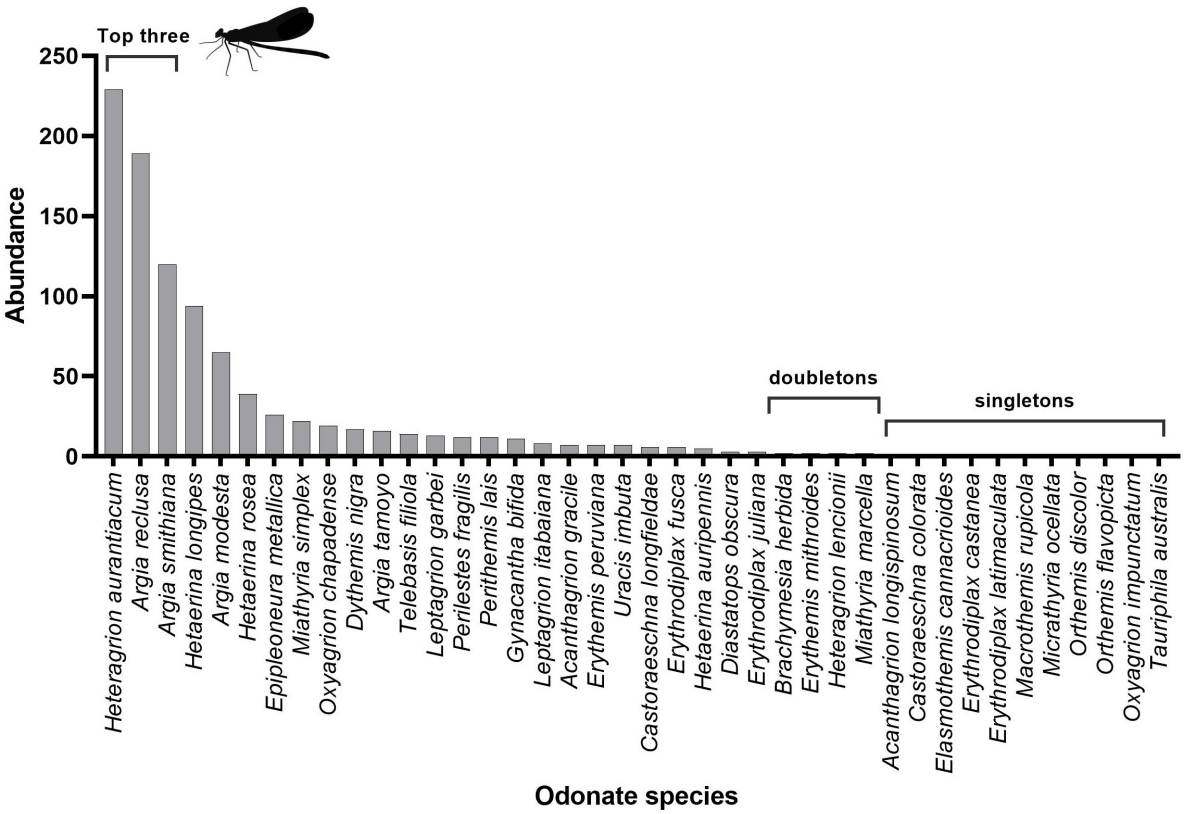

Figure 3. Distribution of the abundance of Odonata species in the Serra of Itabaiana National Park, Sergipe, Brazil.

Calvert, 1909 (Figures 3 and 4). The suborder Anisoptera comprised 11% of the collected individuals, with Libellulidae being the most abundant family.

Our study revealed 27 recent sightings of the Odonata species in the state of Sergipe (Table 2). Consequently, Sergipe has documented 64 species, 35 genera, and nine families (Table 3). Most of the species collected in this study were classified by the Chico Mendes Institute for Biodiversity Conservation (ICMBio, 2024) as least concern (LC). The exceptions are *Leptagrion itabaiana* and *Heteragrion lencionii*, which still do not have information about their respective conservation statuses, and *Leptagrion garbei* Santos, 1961, which is classified as having insufficient data (Table 3).

The extrapolation curve for the total number of Odonata collected in the SINP did not show a stabilizing trend, indicating that additional sampling efforts may have resulted in the discovery of more species (Figure 5). When analyzed independently, the curve for Anisoptera did not approach stabilization, indicating that more sampling effort is needed to record a higher number of species (Figure 5). However, the curve for Zygoptera was close to the asymptote for the 18 sampled species and was extrapolated for 20 species (Figure 5).

Among the most frequent species, *Argia reclusa*, *Heteragrion aurantiacum*, and *Hetaerina longipes* Hagen in Selys, 1853 were found at 65%, 64%, and 55% of the sampling points, respectively (Table 2; Figure 3). Several species, including *Acanthagrion longispinosum* Leonard, 1977, *Castoraeschna colorata* (Martin, 1908), *Elasmothemis cannacrioides* (Calvert, 1906), *Erythrodiplax castanea* (Burmeister, 1839), *Erythrodiplax latimaculata* Ris, 1911, *Macrothemis rupicola* Rácenis, 1957, *Micrathyria ocellata* Martin, 1897, *Orthemis discolor* (Burmeister, 1839), *O. flavopicta* Kirby, 1889, *Oxyagrion impunctatum* Calvert, 1909, and *Tauriphila australis* (Hagen, 1867), were considered singletons; and *Brachymesia herbida* (Gundlach, 1889), *Erythemis mithroides* (Brauer, 1900), *Heteragrion lencionii*, and *Miathyria marcella* (Selys in Sagra, 1857) were considered doubletons (Figure 3).

Discussion

This is the first inventory study of Odonata species in a conservation unit in the state of Sergipe. A total of 40 Odonata species were sampled, with particular emphasis on *Heteragrion lencionii* and *Leptagrion itabaiana*, which were recently described (Vilela et al. 2021a, b), and *Leptagrion garbei*, a recently rediscovered species (Vilela et al. 2022) from data obtained in this study. Additionally, 27 new records of Odonata species have been added for the state of Sergipe. This brings the total number of registered Odonata species for Sergipe to 37 for 64 species (Santos et al. 2020, Vilela et al. 2021a, b, Vilela et al. 2022), an increase of 73% in the knowledge of Odonata in the state. Currently, the richness of Odonata in Sergipe represents approximately 7.5% of the 870 species known to occur in Brazil (IUCN 2024).

The Odonatofauna of Sergipe is comparable to the lists of known Odonata species in other states in the northeast region (*sensu* based on the literature consulted and considering only species with a specific epithet). Bahia had the highest number of occurrence records, with 178 species (Lacerda & Machado 2019, Ribeiro et al. 2021a, b, Vilela et al. 2022), followed by Maranhão (90 spp.; De Marco-Júnior 2008, Bastos

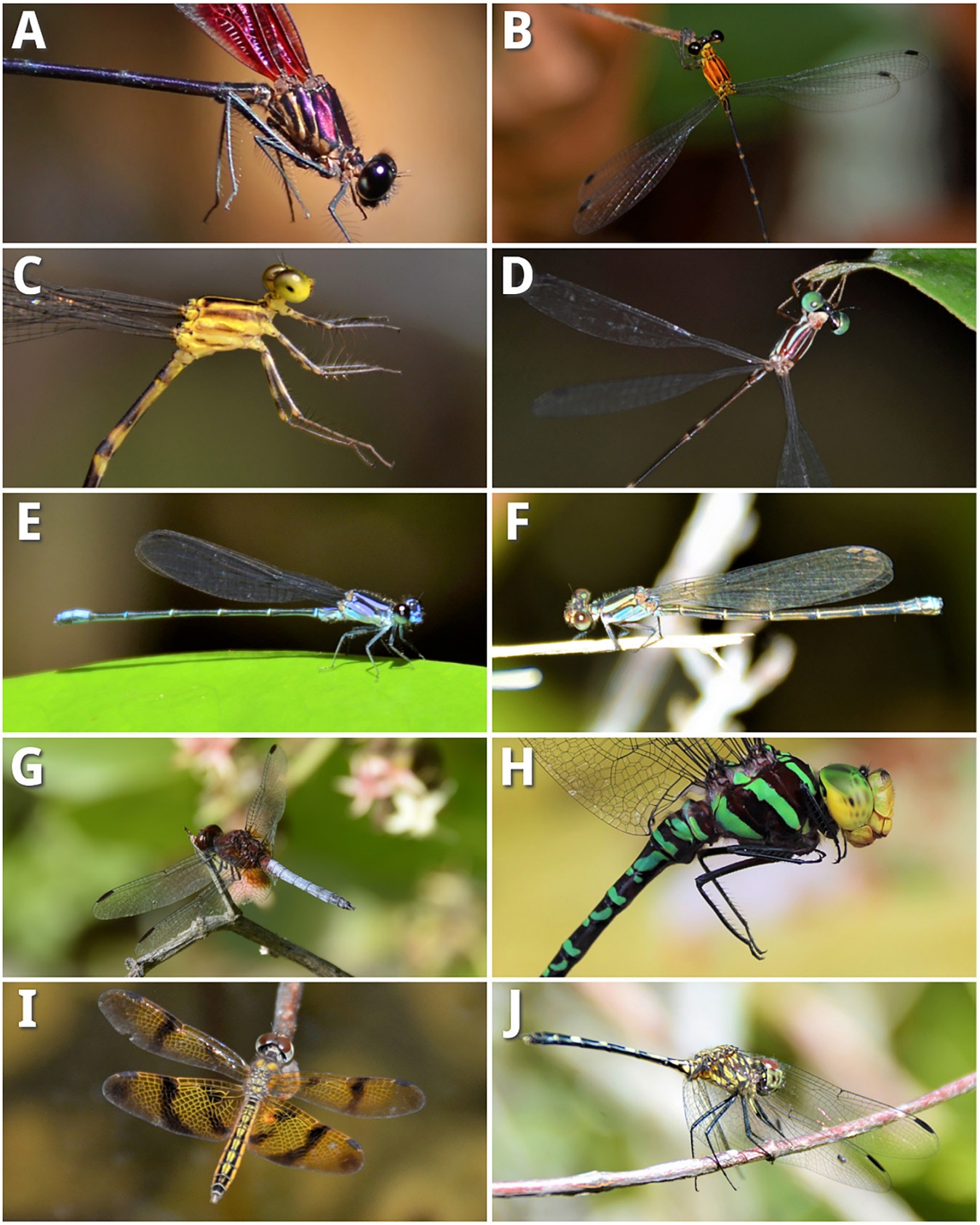

Figure 4. Odonates from Serra of Itabaiana National Park: A) *Hetaerina longipes* Hagen, 1853; B) *Heteragrion aurantiacum* Selys, 1862 (male); C) *Heteragrion aurantiacum* Selys, 1862 (female); D) *Perilestes fragilis* (Hagen, 1862); E) *Argia reclusa* Selys, 1865 (male); F) *Argia reclusa* Selys, 1865 (female); G) *Erythrodiplax fusca* (Rambur, 1842); H) *Castoraeschna* cf. *longfieldae* (Kimmins, 1929); I) *Perithemis lais* (Perty, 1834); and J) *Dythemis nigra* (Martin, 1897). Photos (B; D; E) A.B.S.F. 2021, (A; C; F-J) J.C.S. 2021.

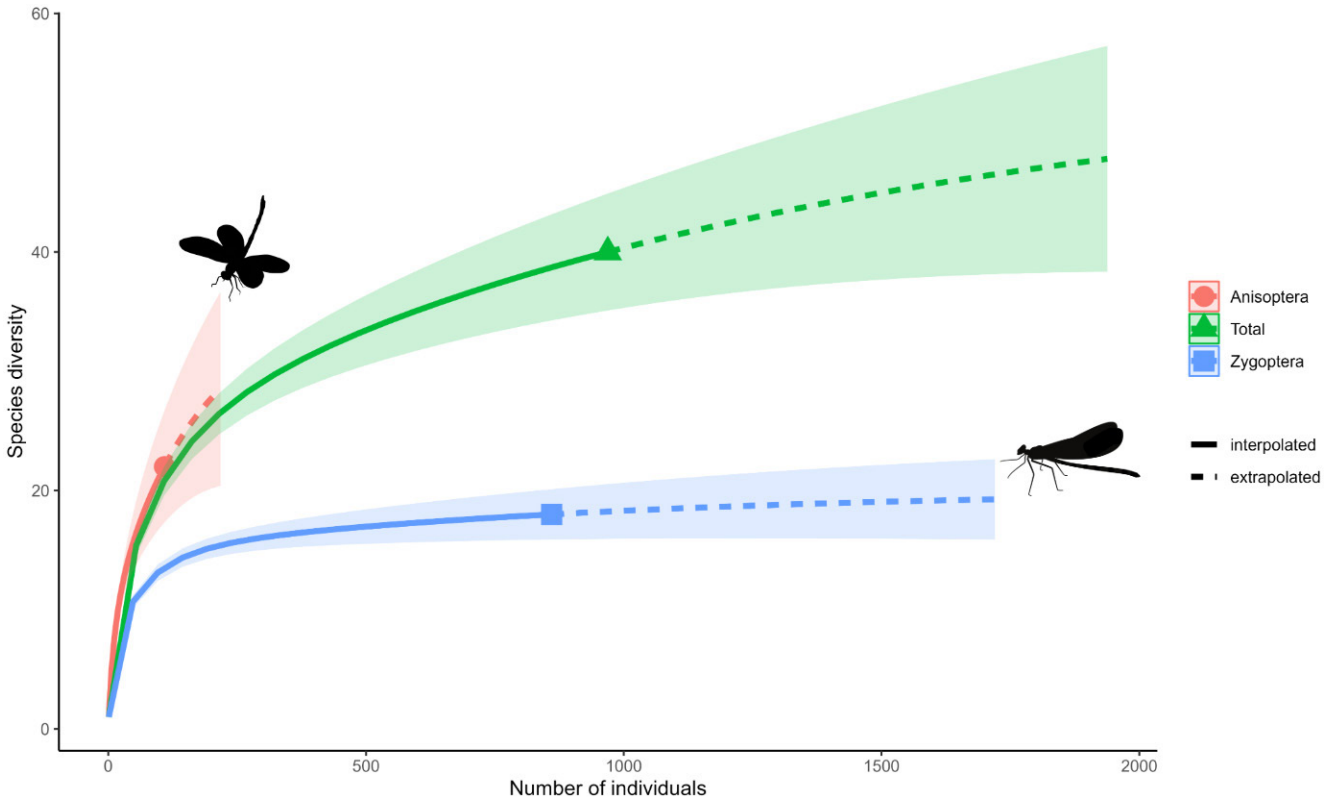

Figure 5. Rarefaction curve with 95% confidence interval for the Odonata species sampled in Serra of Itabaiana National Park, Sergipe, Brazil. The solid line represents the interpolation of the observed number of species, and the dashed line shows the extrapolation of what is expected with a greater sampling effort.

Table 2. List of species, abundance (number of individuals), and new records (*) of dragonflies and damselflies (Insecta: Odonata) in the state of Sergipe. Between P1 and P24, collections were standardized, and between P25 and P38, collections were sporadic. (See Table 1). See Figure 1 for a clearer visual representation of the spatial arrangement of the sampling points.

Taxons	Sampling points	Abundance	New records
Anisoptera			
Aeshnidae			
Castoraeschna cf. *longfieldae* (Kimmins, 1929)	P11, P13, P21	6	*
Castoraeschna colorata (Martin, 1908)	P14	1	*
Gynacantha bifida Rambur, 1842	P37, P38	11	*
Libellulidae			
Brachymesia herbida (Gundlach, 1889)	P15, P36	2	*
Diastatops obscura (Fabricius, 1775)	P35, P36	3	*
Dythemis nigra Martin, 1897	P4, P11, P15, P19, P20, P24, P33	17	Santos et al. (2020)
Elasmothemis cannacrioides (Calvert, 1906)	P8	1	*
Erythemis mithroides (Brauer, 1900)	P15	2	*
Erythemis peruviana (Rambur, 1842)	P15	7	*
Erythrodiplax castanea (Burmeister, 1839)	P24	1	Santos et al. (2020)
Erythrodiplax fusca (Rambur, 1842)	P10, P15, P24	6	Santos et al. (2020)
Erythrodiplax juliana Ris, 1911	P20, P24	3	*
Erythrodiplax latimaculata Ris, 1911	P4	1	Santos et al. (2020)
Macrothemis rupicola Rácenis, 1957	P1	1	*
Miathyria marcella (Selys in Sagra, 1857)	P15, P28	2	Santos et al. (2020)
Miathyria simplex (Rambur, 1842)	P13, P26, P27, P29	22	*
Micrathyria ocellata Martin, 1897	P15	1	*
Orthemis discolor (Burmeister, 1839)	P31	1	Santos et al. (2020)

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Taxons	Sampling points	Abundance	New records
Orthemis flavopicta Kirby, 1889	P35	1	*
Perithemis lais (Perty, 1834)	P5, P9, P15, P16	12	Santos et al. (2020)
Tauriphila australis (Hagen, 1867)	P28	1	*
Uracis imbuta (Burmeister, 1839)	P22, P24, P32	7	*
Zygoptera			
Calopterygidae			
Hetaerina auripennis (Burmeister, 1839)	P9, P15, P16, P17	5	*
Hetaerina longipes Hagen in Selys, 1853	P2, P5, P6, P8, P9, P10, P11, P12, P13, P14, P16, P17, P18, P19, P20, P21, P22, P23, P24, P30, P32	94	*
Hetaerina rosea Selys, 1853	P8, P9, P10, P12, P13, P14, P15, P16, P19, P20, P36	39	*
Coenagrionidae			
Acanthagrion gracile (Rambur, 1842)	P4, P24	7	Santos et al. (2020)
Acanthagrion longispinosum Leonard, 1977	P14	1	*
Argia modesta Selys, 1865	P5, P7, P8, P9, P10, P11, P12, P13	65	*
Argia reclusa Selys, 1865	P2, P3, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P20, P21, P22, P23, P24, P30, P33, P34, P36	189	*
Argia smithiana Calvert, 1909	P1, P2, P4, P8, P10, P11, P12, P13, P14, P18, P19, P20, P23, P32, P33	120	*
Argia tamoyo Calvert, 1909	P21, P22, P30	16	*
Epipleoneura metallica Rácenis, 1955	P9, P10, P16, P17, P18	26	*
Leptagrion itabaiana Vilela, Lencioni & Santos, 2021	P25	8	Vilela et al. (2021)
Leptagrion garbei Santos, 1961	P25, P26	13	Vilela et al. (2022)
Oxyagrion chapadense Costa, 1978	P4, P5, P21, P23, P24	19	*
Oxyagrion impunctatum Costa, 1978	P1	1	*
Telebasis filiola (Perty, 1834)	P12, P15, P16	14	*
Heteragrionidae			
Heteragrion aurantiacum Selys, 1862	P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P16, P17, P18, P20, P21, P22, P23, P30, P32, P33, P34	229	*
Heteragrion lencionii Vilela, Farias & Santos, 2021	P18	2	Vilela et al. (2021)
Perilestidae			
Perilestes fragilis Hagen in Selys, 1862	P3, P7, P8, P12, P13, P17, P20	12	Machado (2015)
6 families – 25 genera – 40 species – 969 individuals		**969**	***27 new records**

Table 3. List of Odonata species recorded in the state of Sergipe, Brazil. Legends: Least Concern (LC); Data Deficient (DD); Not evaluated (N/A) (IUCN 2024. ICMBio 2024).

Taxons	References	IUCN	ICMBio
ANISOPTERA			
Aeshnidae			
Castoraeschna cf. *longfieldae* (Kimmins, 1929)	This study	LC	LC
Castoraeschna colorata (Martin, 1908)	This study	LC	LC
Gynacantha bifida Rambur, 1842	This study	LC	LC
Gomphidae			
Aphylla theodorina Belle, 1992	Belle (1992)	LC	LC
Phyllocycla brasilia Belle, 1988	Belle (1988)	LC	LC
Phyllocycla murrea Belle, 1988	Belle (1988)	LC	LC
Libellulidae			
Anax amazili (Burmeister, 1839)	Santos et al. (2020)	LC	LC

Continue...

...Continuation

Taxons	References	IUCN	ICMBio
Brachymesia herbida (Gundlach, 1889)	This study	LC	LC
Dasythemis esmeralda Ris, 1910	Santos et al. (2020)	LC	LC
Diastatops obscura (Fabricius, 1775)	This study	LC	LC
Dythemis nigra Martin, 1897	Santos et al. (2020)	LC	LC
Elasmothemis cannacrioides (Calvert, 1906)	This study	LC	LC
Elasmothemis sp.	Santos et al. (2020)	LC	LC
Erythemis mithroides (Brauer, 1900)	This study	LC	LC
Erythemis peruviana (Rambur, 1842)	This study	LC	LC
Erythemis vesiculosa (Fabricius, 1775)	Santos et al. (2020)	LC	LC
Erythrodiplax castanea (Burmeister, 1839)	Santos et al. (2020)	LC	LC
Erythrodiplax connata (Burmeister, 1839)	Santos et al. (2020)	LC	LC
Erythrodiplax fusca (Rambur, 1842)	Santos et al. (2020)	LC	LC
Erythrodiplax juliana Ris, 1911	This study	LC	LC
Erythrodiplax latimaculata Ris, 1911	Santos et al. (2020)	LC	LC
Erythrodiplax media Borror, 1942	Santos et al. (2020)	LC	LC
Erythrodiplax umbrata (Linnaeus, 1758)	Santos et al. (2020)	LC	LC
Macrothemis lutea Calvert, 1909	Calvert (1909)	LC	LC
Macrothemis rupicola Rácenis, 1957	This study	LC	LC
Macrothemis sp.	Santos et al. (2020)	LC	LC
Miathyria marcella (Selys in Sagra, 1857)	Santos et al. (2020)	LC	LC
Miathyria simplex (Rambur, 1842)	This study	LC	LC
Micrathyria cf. *pirassununga*e Santos, 1953	Santos et al. (2020)	LC	LC
*Micrathyria hesperi*s (Ris, 1911)	Santos et al. (2020)	LC	LC
Micrathyria ocellata Martin, 1897	This study	LC	LC
Oligoclada abbreviata (Rambur, 1842)	Santos et al. (2020)	LC	LC
Orthemis aequilibris Calvert, 1909	Santos et al. (2020)	LC	LC
Orthemis discolor (Burmeister, 1839)	Santos et al. (2020)	LC	LC
Orthemis flavopicta Kirby, 1889	This study	LC	LC
Pantala flavescens (Fabricius, 1798)	Santos et al. (2020)	LC	LC
Perithemis lais (Perty, 1834)	Santos et al. (2020)	LC	LC
Perithemis mooma Kirby, 1889	Santos et al. (2020)	LC	LC
Tauriphila argo (Hagen, 1869)	Santos et al. (2020)	LC	LC
Tauriphila australis (Hagen, 1867)	This study	LC	LC
Tramea binotata (Rambur, 1842)	Santos et al. (2020)	LC	LC
Tramea cophysa Hagen, 1867	Santos et al. (2020)	LC	LC
Uracis imbuta (Burmeister, 1839)	This study	LC	LC
ZYGOPTERA			
Calopterygidae			
Hetaerina auripennis (Burmeister, 1839)	This study	LC	LC
Hetaerina longipes Hagen in Selys, 1853	This study	LC	LC
Hetaerina rosea Selys, 1853	Santos et al. (2020)	LC	LC
Coenagrionidae			
Acanthagrion gracile (Rambur, 1842)	Santos et al. (2020)	LC	LC
Acanthagrion longispinosum Leonard, 1977	This study	LC	LC
Argia modesta Selys, 1865	This study	LC	LC
Argia reclusa Selys, 1865	This study	LC	LC
Argia smithiana Calvert, 1909	This study	LC	LC
Argia tamoyo Calvert, 1909	This study	LC	LC
Epipleoneura metallica Rácenis, 1955	This study	LC	LC
Ischnura capreolus (Hagen, 1861)	Santos et al. (2020)	LC	LC
Leptagrion itabaiana Vilela, Lencioni & Santos, 2021	Vilela et al.(2021b)	N/A	N/A
Leptagrion garbei Santos, 1961	Vilela et al. (2022)	DD	DD
Oxyagrion chapadense Costa, 1978	This study	LC	LC

Continue...

...Continuation

Taxons	References	IUCN	ICMBio
Oxyagrion impunctatum Costa, 1978	This study	LC	LC
Telebasis filiola (Perty, 1834)	This study	LC	LC
Heteragrionidae			
Heteragrion aurantiacum Selys, 1862	This study	LC	LC
Heteragrion lencionii Vilela, Farias & Santos, 2021	Vilela et al. (2021a)	N/A	N/A
Lestidae			
Lestes forficula Rambur, 1842	Santos et al. (2020)	LC	LC
Perilestidae			
Perilestes fragilis Hagen in Selys, 1862	Machado (2015)	LC	LC
Protoneuridae			
Neoneura sylvatica Hagen in Selys, 1886	Santos et al. (2020)	LC	LC
9 families – 35 genera – 64 species			

et al. 2019, Garcia-Junior et al. 2022, Farias et al. 2023), Ceará (74 spp.; Carvalho & Bravo 2014, Takiya et al. 2016), Paraíba (63 spp.; Koroiva et al. 2021, 2022), Sergipe (62 spp.; this study), Alagoas (46 spp.; Godé & Ferreira-Peruquetti 2015, Lacerda & Machado 2019, Farias et al. 2023), Pernambuco (23 spp.; Mesquita & Matteo 1991, Carvalho & Bravo 2014, Nobre 2016, Takiya et al. 2016, Bastos et al. 2019, Lacerda & Machado 2019, Farias et al. 2023), Piauí (6 spp.; Takiya et al. 2016), and Rio Grande do Norte (4 spp.; Carvalho & Bravo 2014, Irusta & Lencioni 2015, Nobre 2016, Farias et al. 2023).

The Odonata sampling method applied in this study is the most effective compared to other methods (Cezário et al. 2021). However, the use of other sampling methodologies such as malaise and light traps can increase the sample size and enable the capture of other species, including families that were not represented in this study, rare species (Almeida et al. 2013), species that reach great heights, and species with crepuscular habits (Bedê et al. 2000). Therefore, the use of these methodologies could complement species sampling, especially Anisoptera, since the extrapolation for this suborder is far from reaching an asymptote. However, sporadic collections have made it possible to collect several species that are usually not sampled using the standardized method. For example, individuals collected at sporadic collection points (P26, P27, P28, P29, P37, and P38) showed curious aggregation behavior, where numerous dragonfly individuals grouped and flew regularly in the same spot. At most collection points, individuals of the species *Miathyria simplex* (Rambur, 1842) were collected. In some collection events, 11 individuals (two males and one female, P38; five males and three females, P37) of the species *Gynacantha bifida* Rambur 1842 were also captured, which showed the same aggregation behavior. This species has crepuscular habits, and the individuals were captured between 5:00 pm and 5:45 pm in an open area close to vegetation cover, flying at high speed and at a considerably high altitude (between 2 and 4 m), as described in the literature (Bedê et al. 2000).

Conclusion

This study on the odonatofauna of SINP significantly contributes to the knowledge of the distribution of Odonata species in the state of Sergipe and the Northeast region. Additionally, new records of Odonata species have been added to the Northeastern Atlantic Forest, highlighting the importance of maintaining and conserving the habitats of this region. In general, more species inventory studies are needed for Odonata in the state of Sergipe, especially when considering the heterogeneity of ecosystems found in the state, such as the Atlantic Forest, Restinga, and Caatinga. Finally, this study can assist SINP managers in decision-making regarding the conservation of dragonfly species and park habitats.

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Antonio Bruno Silva Farias: contributed to data collection, data analysis, review, editing, and manuscript preparation.

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Jean Carlos Santos: contributed to data collection, review, editing, and manuscript preparation.

Conflicts of Interest

The authors declare that they have no conflicts of interest related to the publication of this manuscript.

Ethics

This study did not involve human subjects or clinical trials, which require authorization by an Institutional Committee.

Data Availability

Supporting data are available at <https://doi.org/10.48331/scielodata.QLJCQW>.

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