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Phytosociology in a fragment of seasonal semideciduous forest in a legal reserve in the southwest of the Goiás state

Fitossociologia em fragmento de floresta estacional semidecidual em reserva legal no sudoeste do estado de Goiás

Fitosociología en un fragmento de bosque semideciduo estacional en una reserva legal en el suroeste del estado de Goiás

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Abstract
In Goiás, seasonal forests structure studies are scarce, especially in fragments located in legal reserves, subject to human disturbances. Therefore, the study aimed to perform the phytosociology of a fragment of a rural property, in a seasonal semideciduous forest. We evaluated structure, richness, diversity, dispersion mechanisms, ecological groups, and species distribution patterns found in the study and floristic links between Cerrado, Amazon and Atlantic Forest. In a one-hectare sample plot, all live trees with a diameter at breast height ≥ 10 cm were measured. The values of density and basal area were 561 ind.ha^{-1} and 26.2 m².ha^{-1}, respectively. We recorded 37 species with diversity indices (H') of 2.36 and evenness (J') of 0.65. *Toulicia reticulata*, *Chaetocarpus echinocarpus*, *Bocageopsis mattogrossensis* and *Nectandra cuspidata* were species with the highest importance value, corresponding to 69% and 65% of all density and basal area, respectively. Fabaceae obtained the highest floristic richness, with six species, although it was little represented in terms of abundance. Our results suggest that the fragment is a mature forest in good conservation status. This is reinforced by the high size of trees, in addition to the predominance of zoochoric (83.8%) and secondary (92.1%) individuals in the survey.
Keywords: Woody structure and plant diversity; Forest deciduousness; Forest fragmentation; Legal reserve importance.

Resumo
Em Goiás, estudos sobre estrutura de florestas estacionais são escassos, especialmente em fragmentos localizados em reservas legais, sujeitos à distúrbios antrópicos. Portanto, o estudo teve como objetivo realizar um levantamento fitossociológico de um fragmento de floresta estacional semidecidual, em uma propriedade rural. Avaliamos estrutura,

riqueza, diversidade, mecanismos de dispersão, grupos ecológicos, e padrões de distribuição das espécies encontradas no estudo e elos florísticos entre Cerrado, Amazônia e Mata Atlântica. Em um bloco amostral de um hectare, foram medidas todas as árvores vivas com diâmetro à altura do peito ≥ 10 cm. Os valores para densidade e área basal foram de 561 ind.ha^{-1} e 26,2 m².ha^{-1}, respectivamente. Registramos 37 espécies, com índices de diversidade (H') de 2,36 e equabilidade (J') de 0,65. *Toulicia reticulata*, *Chaetocarpus echinocarpus*, *Bocageopsis mattogrossensis* e *Nectandra cuspidata* foram espécies com maior valor de importância, correspondendo a 69% e 65% de toda densidade e área basal, respectivamente. Fabaceae obteve a maior riqueza florística, com seis espécies, embora tenha sido pouco representada em termos de abundância. Nossos resultados sugerem que o fragmento é uma floresta madura em bom estado de conservação. Isso é reforçado pelo elevado porte das árvores, além da predominância de indivíduos zoocóricos (83,8%) e secundárias (92,1%) no levantamento.
Palavras-chave: Estrutura lenhosa e diversidade vegetal; Floresta subcaducifólia; Fragmentação florestal; Importância de reservas legais.

Resumen
En Goiás, los estudios sobre la estructura de los bosques estacionales son escasos, especialmente en fragmentos ubicados en reservas legales, sujetos a perturbaciones humanas. Por lo tanto, el estudio tuvo como objetivo realizar un levantamiento fitosociológico de un fragmento de bosque subcaducifolio, en una propiedad rural. Evaluamos estructura, riqueza, diversidad, mecanismos de dispersión, grupos ecológicos y patrones de distribución de las especies encontradas en el estudio y vínculos florísticos entre el Cerrado, la Amazonía y la Mata Atlántica. En un bloque de muestra de una hectárea, se midieron todos los árboles vivos con un diámetro a la altura del pecho ≥ 10 cm. Los valores de densidad y área basal fueron 561 ind.ha^{-1} y 26.2 m².ha^{-1}, respectivamente. Registramos 37 especies, con índices de diversidad (H') de 2.36 y equidad (J') de 0.65. *Toulicia reticulata*, *Chaetocarpus echinocarpus*, *Bocageopsis mattogrossensis* y *Nectandra cuspidata* fueron las especies más importantes, correspondientes al 69% y 65% de toda la densidad y área basal, respectivamente. Fabaceae obtuvo la mayor riqueza florística, con seis especies, aunque estuvo poco representada en términos de abundancia. Nuestros resultados sugieren que el fragmento es un bosque maduro en buenas condiciones. Esto se ve reforzado por el alto tamaño de los árboles, además del predominio de individuos zoochóricos (83.8%) y secundarios (92.1%) en levantamiento.
Palabras clave: Estructura leñosa y diversidad vegetal; Bosque de subcaducifolia; Fragmentación forestal; Importancia de las reservas legales.

1. Introduction

Cerrado shows a wide environmental heterogeneity, due to several physical aspects, forming a complex physiognomic diversification (Silva et al., 2019), which makes it the most biodiverse savanna on the planet with strategic biogeographic regions that deserve conservation priorities (Françoso et al., 2019). It has floristic links with the Amazon and Atlantic Forests, which exhibit influence on their diversity, and distinct patterns of species distribution (Méio et al., 2003, Falcão & Monteiro, 2020). However, because of the high endemism rates, species risks of extinction and constant threats due to deforestation, to make space especially for agricultural crops, make it one of the global *hotspots* (Sano et al., 2019). Legal Reserves (LR) are fundamental tools to mitigate these anthropic impacts and the fragmentation processes of native vegetation.

The LR are natural ecosystems of a rural property, intended for the conservation and shelter of the local biota, the provision of environmental services and the sustainable use of resources. Therefore, regions where agriculture is predominant, LR act in the natural control of pests and act as barriers in the spread of diseases (Delalibera et al., 2008), in addition to the maintenance of soils, water resources and ecological processes (Prado Júnior et al., 2010). In the southwestern region of Goiás state, in general, LR protect typical cerrado, woody savana and dry forests, known in the Brazilian Central Plateau as seasonal forests. Among these, Semideciduous Seasonal Forests (SSF) are recognized for their deciduous nature during the dry season, reaching a loss of 20-50% of the leaves.

In the last decades, studies in SSF have increased, expanding the knowledge about the ecology of forests, highlighting their importance, and providing subsidies for conservation. In Goiás state, studies indicate that this physiognomy has particularities from one place to another (Imaña-Encinas et al., 2008), since the heterogeneity of habitats and alternation of flora species diverges between studies (Souza et al., 2018). Especially in the southwest of Goiás, research on the structure of vegetation is still scarce in seasonal forests (Milhomem et al., 2013; Souza et al., 2018).

Floristic and phytosociology studies can expand the ecological knowledge of plant communities (Marangon et al., 2007). They can also generate information capable of inferring about the conservation status of forest fragments, when the dispersion strategies and the predominant successional categories are evaluated (Dias Neto et al., 2009; Negrini et al., 2012). Considering the scarcity of studies, associated with the expansion of agriculture, with intense modifications of natural ecosystems (Souza et al., 2018), it is crucial to expand the knowledge of forest formations located in LR in southwestern Goiás state.

Therefore, this study aimed to evaluate the structure, richness and plant diversity of the tree community of a fragment of a seasonal semideciduous forest which is close to the limits of the transition with the Atlantic Forest biome, according to IBGE (2004). Expanding the knowledge of vegetation, the aspects of the community and populations were evaluated and discussed based on the dispersion mechanisms and successional categories (ecological groups). In addition to floristic aspects related to species distribution and influence of the Amazon and Atlantic biomes on Cerrado.

2. Material and Methods

2.1 Study site

The study was carried out in a fragment of a seasonal semideciduous forest (SSF), located 90 km from Jataí, southwest of Goiás state. The fragment has approximately 46 hectares, and is part of 'Fazenda São José' LR (18º27'43"S / 51º37'10"W), at an altitude of around 600m. The fragment surroundings are dominated by pasture and have less predominance of agriculture, although the region has gradually been occupied by monocultures, especially by the advance of soybean, corn and sugar cane crops.

The climate of Jataí is classified as Aw, according to Köppen, with seasonality marked by drought in the winter and rain in the summer. The annual average rainfall is approximately 1650 mm, with rainfall occurring mainly between the months of October and April (Alvares et al., 2013). In the rainy season, the humidity is always higher than 70%, with higher average temperatures. In the dry period, the average temperature approaches 18ºC, in which the relative moisture does not exceed 50%, with extreme ones occurring in June and July (Guilherme et al., 2011).

The study region is located in one of the tributaries in the Verde river basin, tributary of Paranaíba river. Argisols and Cambisols occur, although Oxisols are predominant at the study site. Geomorphology is expressed by planning surface in flat to gently undulating reliefs (Hermuche et al., 2009). This is one of the reasons that explain the very fragmented landscape, favoring the expansion of agriculture. These fragments are mainly from well drained SSF and Cerradões, deciduous forests in slightly steeper regions, close to Verde river, in addition to narrow strips of gallery and riparian forests protecting the water courses.

2.2 Tree vegetation survey and data analysis

For the phytosociological survey, 25-20×20m (400m^2) permanent plots (aiming at continuous monitoring) of were allocated contiguously, totaling a 100×100m sample (one hectare). All live trees with DBH (diameter breast height) ≥10 cm to 1.30 cm from the ground were measured with a diametric tape and the height of the individuals was estimated with the aid of graduated stick. For individuals with multiple stems that showed at least one of the stems within the inclusion criteria, they were sampled as separate individuals. The trees measured were marked with aluminum tags, for future vegetation monitoring.

In general, the botanical identification was performed in the field, by the team that has extensive experience in the tree species identification in southwest Goiás. But the doubtful material was collected and herborized for later identification. Fertile branches were incorporated at Herbário Jataiense of Universidade Federal de Jataí. The classification of species in botanical families followed the system of the Angiosperm Phylogeny Group (APG IV 2016).

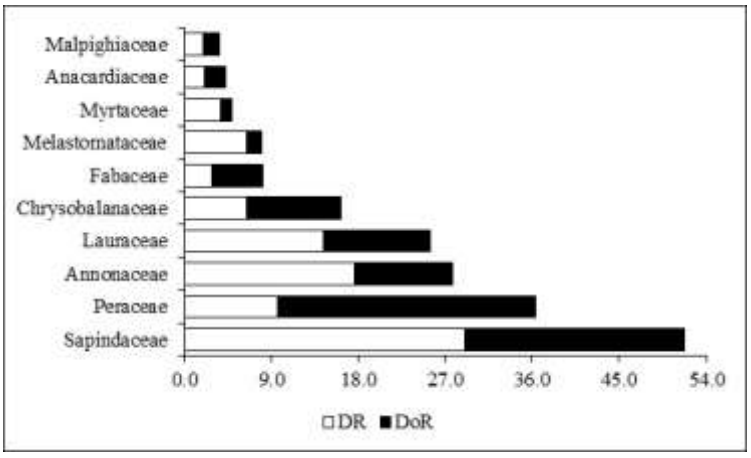
The phytosociological parameters of relative density (DR), frequency (FR) dominance (DoR) was recorded, and the sum of these relative parameters generates an importance value (VI), that was calculated for each species. The coverage value (CV = Dr + DoR) was also calculated for the main botany families. In addition to the Shannon diversity index (H') and Pielou evenness index (J') (Brower & Zar, 1984). The analyses were performed in a Microsoft Office Excel 2016® spreadsheet.

In analyzing the species distribution by biomes, Flora do Brasil (2020) was consulted. For dispersion mechanisms, species were classified as zoochoric, anemochoric and autochoric, based on field experiences and knowledge about species taxonomy and fruit morphology. Regarding to ecological groups, the species were classified as pioneer, early and late secondary, in order to understand the successional stage and the fragment conservation status. As it is somewhat subjective, this classification was based on field experience and the definition applied in other related studies in SSF (*e.g*. Marangon et al., 2007; Prado Júnior et al., 2010; 2012; Milhomem et al., 2013).

3. Results

Twenty-one (21) botanical families and 37 species in the survey were registered (Table 1). Fabaceae showed the highest richness, with six species, followed by Euphorbiaceae and Chrysobalanaceae (three species each). However, Fabaceae comprised just under 3% of the total individuals in the survey. While Sapindaceae, Peraceae, Annonaceae and Lauraceae were the most important in number of individuals and basal area, and the ten species with the highest coverage value contributed with just over 90% of CV total recorded in the survey (Figure 1). As Considering the species, 27 (73.0%) occur in Cerrado, Amazon and Atlantic Forest, four (10.8%) only in Cerrado and Amazon, and another four only in Cerrado and Atlantic Forest. Only *Chrysophyllum flexuosum* and *Aspidosperma polyneuron* (5.4%) are considered exclusive to the Atlantic Forest.

Figure 1. Sum of relative density (DR) and dominance (DoR) for the ten species with the highest Coverage Value recorded in the survey of semideciduous seasonal forest in southwest Goiás state.



Source: Authors.

Table 1. Phytosociological parameters of tree species with their respective botanical families, ecological groups and dispersion mechanisms, in the survey of semideciduous seasonal forest in southwest Goiás state. NI = number of individuals; BA = basal area; DR = relative density; DoR = relative dominance; FR = relative frequency; VI = importance value; SG = successional group (P = pioneer, ES = early secondary, LS = late secondary); DM = dispersion mecanisms (Zo = zoochoric, An = anemochoric, Au = autochoric). Species are listed in descending order of VI.

Família	Espécies	NI	BA	DR	DoR	FR	VI	SG	DM
Sapindaceae	*Toulicia reticulata* Radlk	162	5.927	28.9	22.6	12.5	63.99	ES	An
Peraceae	*Chaetocarpus echinocarpus* (Baill) Ducke	46	5.601	8.2	21.4	9.4	38.94	ES	Zo
Annonaceae	*Bocageopsis mattogrossensis* R.E.F.r	99	2.649	17.6	10.1	10.9	38.69	ES	Zo
Lauraceae	*Nectandra cuspidata* Nees	81	2.884	14.4	11.0	9.9	35.33	ES	Zo
Chrysobalanaceae	*Licania kunthiana* Hook.f.	31	2.416	5.5	9.2	6.8	21.51	ES	Zo
Melastomataceae	*Miconia flammea* Casar.	33	0.398	5.9	1.5	7.8	15.21	ES	Zo
Myrtaceae	*Myrciaria floribunda* (H.WestexWilld.) O.Berg	20	0.293	3.6	1.1	5.7	10.41	LS	Zo
Peraceae	*Pera anisotricha* Müll.Arg.	8	1.405	1.4	5.4	3.1	9.91	ES	Zo
Anacardiaceae	*Tapirira guianensis* Aubl.	9	0.397	1.6	1.5	3.1	6.24	ES	Zo
Malpighiaceae	*Byrsonima sericea* DC.	11	0.437	2.0	1.7	2.6	6.23	ES	Zo
Fabaceae	*Hymenaea courbaril* L.	2	1.069	0.4	4.1	1.0	5.48	LS	Zo
Rubiaceae	*Ixora venulosa* Benth.	7	0.183	1.2	0.7	3.1	5.07	LS	Zo
Araliaceae	*Schefflera morototoni* (Aubl.) Maguire et al.,	3	0.758	0.5	2.9	1.6	4.99	P	Zo
Fabaceae	*Inga vera* Willd.	10	0.154	1.8	0.6	2.6	4.97	ES	Zo
Boraginaceae	*Cordia sellowiana* Cham.	5	0.307	0.9	1.2	2.6	4.67	ES	Zoo
Chrysobalanaceae	*Hirtella racemosa* Lam.	4	0.096	0.7	0.4	2.1	3.16	LS	Zo
Anacardiaceae	*Astronium fraxinifolium* Schott.	3	0.145	0.5	0.6	1.6	2.65	ES	An
Euphorbiaceae	*Maprounea guianensis* Aubl.	4	0.042	0.7	0.2	1.6	2.44	ES	Zo
Fabaceae	*Ficus gomelleira* Kunth.	1	0.398	0.2	1.5	0.5	2.22	ES	Zo
Melastomataceae	*Miconia splendens* (Sw). Griseb.	3	0.028	0.5	0.1	1.6	2.20	ES	Zo
Rubiaceae	*Coussarea hydrangeifolia* (Benth.) Müll.Arg.	2	0.030	0.4	0.1	1.0	1.51	ES	Zo
Salicaceae	*Casearia gossypiosperma* Briq.	2	0.029	0.4	0.1	1.0	1.51	ES	Zo
Combretaceae	*Buchenavia tetraphylla* (Aubl) R.A. Howard	1	0.151	0.2	0.6	0.5	1.28	LS	Zo
Fabaceae	*Tachigali vulgaris* L.G.Silva&H.C.Lima	1	0.086	0.2	0.3	0.5	1.03	P	An
Sapotaceae	*Micropholis venulosa* (Mart. &Eichler) Pierre	1	0.070	0.2	0.3	0.5	0.97	ES	Zo
Myristicaceae	*Virola sebifera* Aubl.	1	0.047	0.2	0.2	0.5	0.88	ES	Zo
Celestraceae	*Cheiloclinium cognatum* (Miers) A.C.Sm.	1	0.041	0.2	0.2	0.5	0.86	LS	Zo
Fabaceae	*Copaifera langsdorffii* Desf.	1	0.041	0.2	0.2	0.5	0.86	ES	Zo
Chrysobalanaceae	*Hirtella glandulosa* Spreng.	1	0.036	0.2	0.1	0.5	0.84	ES	Zo
Apocynaceae	*Aspidosperma polyneuron* Müll.Arg.	1	0.025	0.2	0.1	0.5	0.80	LS	An
Sapindaceae	*Cupania vernalis* Cambess.	1	0.013	0.2	0.0	0.5	0.75	ES	Zo
Sapotaceae	*Chrysophyllum flexuosum* Mart.	1	0.012	0.2	0.0	0.5	0.75	LS	Zo
Fabaceae	*Inga laurina* (Sw.) Willd.	1	0.010	0.2	0.0	0.5	0.74	ES	Zo
Euphorbiaceae	*Mabea fistulifera* Mart.	1	0.010	0.2	0.0	0.5	0.74	P	Au
Euphorbiaceae	*Sapium glandulosum* (Vell.) Pax	1	0.010	0.2	0.0	0.5	0.74	P	Zo
Myrtaceae	*Myrcia fenzliana* O.Berg	1	0.008	0.2	0.0	0.5	0.73	LS	Zo
Fabaceae	*Machaerium brasiliense* Vogel	1	0.008	0.2	0.0	0.5	0.73	ES	An

Source: Authors.

The survey had a total density of 561 ind.ha^{-1}, average height of 17.7m and a total basal area of 26.2 m^2.ha^{-1}. Only eight species contributed with almost 65% of all VI and covered 86% of the density in all survey. This explains the low values of diversity index and evenness index recorded, which were H' = 2.36 and J' = 0.65. *Toulicia reticulata* obtained the highest VI, mainly due to the high abundance, comprising 28.9% of the entire survey density. The species was also well distributed throughout the plots and with large individuals and, therefore, with high frequency and relative dominance, respectively (Table 1). *Chaetocarpus echinocarpus*, obtained the second largest VI, especially due to the high basal area and with 8.1% of total density. *Bocageopsis mattogrossensis*, had the third largest VI due to the second highest density in the survey. *Nectandra cuspidata* was the fourth species with the highest VI, also mainly due to the high density. These four species also showed high values of basal area, with large individuals in the survey. The four other species with higher VI (*Licania kunthiana*, *Miconia flammea*, *Myrciaria floribunda* and *Pera anisotricha*) accounted 16.4% of all VI. In contrast, thirteen species (35%) had VI below 1%, among them *Chrysophyllum flexuosum* and *Mabea fistulifera*.

Regarding the dispersion mechanisms (Table 1), the community showed 31 zoochoric species (83.8%), five anemochoric (13.5%), and one autochoric (2.7%). In terms of abundance, the zoochory mechanism also stood out with almost 70% of all individuals in the survey. In the classification into ecological groups (Table 1), only four species (10.8%) and six individuals (1%) are pioneers. In turn, 24 species (64.8%) are initial secondary, totaling 517 individuals (92.1%), and nine species (24.3) are late secondary, totaling 38 individuals (6.8%). Among the eight main species, except for *Myrciaria floribunda* (late secondary), seven are initial secondary species, representing 460 individuals of this total.

4. Discussion

There was no predominance of species exclusive to the Cerrado-Amazon or Cerrado-Atlantic Forest, nor even species exclusive to Cerrado, and only two exclusives to the Atlantic Forest: *Chrysophyllum flexuosum* and *Aspidosperma polyneuron* (Flora do Brasil, 2020). However, the predominance of species shared between these two typically forest biomes (Amazon and Atlantic Forest) is notorious with the seasonal forests of Cerrado. These findings reinforce the importance of Cerrado in the formation of this floristic link, not only through forests associated with watercourses, but also through dry forests (Falcão & Monteiro, 2020, Lopes et al., 2020). Even with the greater proximity of the study area to the Atlantic biome, the current research did not corroborate the study by Méio et al. (2003), in which it emphasizes a greater influence of the Atlantic Forest on Cerrado than on the Amazon.

The basal area found here was similar to other studies in SSF, with values between 24.6 and 26.4 m^2.ha^{-1}, which may indicate forests in initial and intermediate stages of succession (Marangon et al., 2007; Prado Júnior et al., 2012). Large trees, as found in the study, also indicate an advanced stage of forest maturity. Dias Neto et al. (2009) report that the large tree size is a good indicator of the community maturity stage.

In Cerrado, studies in SSF showed values of diversity ranging from 3.25 to 3.97 (Guilherme & Nakajima, 2007; Prado Júnior et al., 2010; 2012), whereas in the Atlantic Forest, the estimate of diversity in SSF ranged between 2.82 and 4.25 (Silva et al., 2004; Marangon et al., 2007; Fonseca & Carvalho, 2012; Lisboa et al., 2019). Specifically, for the southwest of Goiás state, Souza et al. (2018) estimated the diversity index at 3.26 and Carneiro et al. (2011) in 1.38, which suggest an indication of environment disturbance. Likewise, Dan et al. (2010) reported that low diversity values are associated with severely altered SSF. Therefore, this distinction in the registered values seems to be associated, not only with disturbs of different origins, but also with the variation in the inclusion criteria and in the size of the sample area between the studies. As the SSF fragment studied showed few anthropization signs, we suggest that the low diversity found is related to the predominance of a small group of species in the community, as seen in the low evenness and also emphasized in other studies, as Fonseca & Carvalho (2012).

This prevailing species and with higher VI in our study, such as *Toulicia reticulata*, *Boccageopsis mattogrossensis*, *Licania kunthiana*, *Miconia flammea*, *Myrciaria floribunda* and *Pera anisotricha* generally are not registered in phytosociological surveys in SSF or, when they appear, they are not very representative, as is the case of *L. kunthiana* (Milhomem et al., 2013). This indicates the uniqueness of these SSF fragments, regarding the composition of the species (Dias Neto et al., 2009). Although in an evergreen seasonal forest in the Amazon, *C. echinocarpus* stood out for its abundance and high VI (Kunz et al., 2008), and a study in LR in southwest Goiás showed that *Nectandra cuspidata* is not very expressive (Souza et al., 2018).

Chrysophyllum flexuosum with unprecedented record for Goiás (Flora do Brasil, 2020). Kunz & Martins (2014), categorized the species as an indicator of forest in an advanced stage of regeneration, in the SSF located in the Atlantic biome. *Mabea fistulifera*, with only one tree registered in the survey, is considered a highly competitive and fast-growing species in seasonal forests (Souza et al., 2012), and its abundance is related to some anthropic disturbance in forest formations. Again, these results demonstrate the good conservation status of the studied fragment with few species and individuals typical of the initial stages of forest succession.

The predominance of zoochoric dispersion mechanisms in both species richness and abundance of individuals corroborate other studies carried out in SSF, in which more than 50% of the species are zoochoric, reinforcing the fragment importance for the maintenance of local fauna (Prado Júnior et al., 2010; Milhomem et al., 2013). Negrini et al. (2012) also reports the importance of zoochoric species for the natural ecosystem self-regulation, because of the attraction of animals, the forest succession can occur more quickly. In addition, such fragments are functionally important as ecological corridors for the flow of biodiversity (Closset-Kopp et al., 2016). Regarding ecological groups, Milhomen et al. (2013) reported 61% of the species in an SSF as initial secondary, considering the community in good conservation status. Marangon et al. (2007) and Prado Júnior et al. (2012) also registered predominance of initial secondary species, pointing out that the studied fragments are in succession intermediate stages. In the current study, the record of a few species and individuals classified as pioneers, expresses that the LR has no obvious signs of human disturbances.

The relevance of Fabaceae has been common as the richest in surveys carried out in SSF (Silva et al., 2004; Imaña-Encinas et al. 2008; Prado Júnior et al., 2010; Dan et al., 2010; Lisboa et al., 2019). This expressiveness also occurs in other forest and savanna formations in Cerrado, in Goiás state, as already noted in cerrado *sensu stricto* (Silva et al., 2019), rocky outcrops in Cerrado (Leles & Diniz, 2017), woody savanna or 'cerradão' (Guilherme et al., 2020), riparian forest (Ferreira et al., 2020) and deciduous dry forest (Andriani et al., 2020). This predominance of the family in studies of tree structures in natural ecosystems is attributed to the efficiency in nitrogen fixation (Françoso et al., 2016), and yet many species have mutualistic relationships, such as mycorrhizae (Abreu et al., 2018).

Possibly, the good vertical structure of the forest provides accumulation of organic matter and greater fertility in the soil, which would function as a natural cycle of a forest in good condition, facilitating the predominance of other species that would not require these selective interactions, as occurs for the Fabaceae. Furthermore, this efficiency in fixing nitrogen in the soil, allows us to infer about the relevance of this family in the initial stages of forest succession, acting as facilitators for species from other families of more advanced successional stages. Gusson et al. (2008), found that there is a reduction in the abundance individuals of several Fabaceae species as the successional stages advance from initial to mature in fragments of SSF.

These findings, once again, reinforce that the SSF studied is in good conservation condition. Thus, the study highlights the potential of LR in southwest Goiás for maintaining the biodiversity and ecosystem services, being an excellent mechanism for the conservation of natural environments, water resources and soil, mostly in seasonal forests.

5. Conclusion

Even with low plant richness and diversity, the survey showed indications of the good conservation status and maturity of the SSF fragment, and its importance as an LR in maintaining of the environment balance and functionality of ecosystem services. The results that reinforce this are the high average height and basal area in the community, predominance of both species and abundance of zoochoric and secondary trees, in addition to low density of individuals of the Fabaceae. The maintenance of these LR is also fundamental for the conservation of few documented species and maintenance of ecological corridors, which function as floristic links between dry and humid forests in Cerrado, with the Amazon and Atlantic forest biomes.

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