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VASCULAR FLORA CHECKLIST OF THE IBICATU ECOLOGICAL STATION, PIRACICABA, SÃO PAULO, BRAZIL[1]

ESPÉCIES DA FLORA VASCULAR DA ESTAÇÃO ECOLÓGICA DE IBICATU, PIRACICABA, SÃO PAULO, BRASIL

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ABSTRACT – Small forest fragments are recognized as relevant for the preservation of the São Paulo State Semideciduous Seasonal Forest. Our research presents an updated checklist of the vascular flora of the small fragment of legally protected forest, located in the São Paulo State countryside, known as Ibicatu Ecological Station, with the main goal of discussing its importance for local and regional biodiversity conservation. We used the walking method, for a qualitative floristic survey, and botanical material was collected in reproductive and vegetative state. We sampled 187 species typical of the semideciduous seasonal forest, distributed in different eight life forms, with predominance of non-woody life forms, especially herbs and epiphytes. We identified 11 endangered species, including *Peperomia hydrocotyloides*, considered extinct from the São Paulo State, and some exotic and invasive species. We consider that this small forest fragment present rich vascular flora typical of the São Paulo countryside, in different life forms, and it is essential for local and regional biodiversity. This study added 102 species to the previously published checklist, emphasizing the importance of floristic surveys that include all life forms.

Keywords: Atlantic Forest; conservation; Seasonal Semideciduous Forest.

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RESUMO - Os pequenos fragmentos florestais são reconhecidamente relevantes para a preservação da Floresta Estacional Semidecidual do estado de São Paulo. Nossa pesquisa apresentou uma ampla lista de espécies da flora vascular de um pequeno fragmento florestal legalmente protegido. Este fragmento localiza-se no interior do estado de São Paulo, e é denominado "Estação Ecológica Ibicatu". Este estudo teve como objetivo principal discutir a importância deste fragmento para a conservação das biodiversidades local e regional. Foi utilizado o método de caminhamento, para um levantamento florístico qualitativo, em que os materiais em estado reprodutivo e vegetativo foram coletados. Foram amostradas 187 espécies típicas da Floresta Estacional Semidecidual, distribuídas em oito distintas formas de vida, com predomínio de formas de vida não lenhosa, e com destaque para ervas e epífitas. Identificaram-se 11 espécies ameaçadas de extinção, dentre elas, *Peperomia hydrocotyloides,* considerada extinta no estado de São Paulo, assim como algumas espécies exóticas invasoras. Considera-se que este pequeno fragmento florestal mantém uma rica flora vascular típica das florestas do interior paulista, em distintas formas de vida; e por este motivo, relevante para a biodiversidade local e regional. Este estudo também acrescentou 102 espécies à lista anteriormente publicada, enfatizando a importância dos levantamentos florísticos que incluem todas as formas de vida.

Palavras-chave: Floresta Atlântica; conservação; Floresta Estacional Semidecidual.

1 INTRODUCTION

Tropical forest fragments inserted in cultivated landscapes are, in most cases, small, and undergo degradation, such as the edge effects (Benitez-Malvido and Martinez-Ramos, 2003; Laurence et al., 2007), in addition to other ever-present pressures. Small forest fragments in agricultural landscapes contribute to maintain local fauna (Dias et al., 2016; Beca et al., 2017), ecosystem services (Turner et al., 2007), and can to maintain genetic flow (Martins et al., 2016), among other positive factors for the local and regional biodiversity. It is a key element for the qualitative recovery of human-modified landscapes, to ensure sustainability and improve quality of life (Viana and Pinheiro, 1998; Vidal et al., 2016).

The Atlantic Forest of the São Paulo State countryside, considered a global hotspot for conservation hotspot (Myers, 2003; Mittermeier et al., 2004), has been getting smaller, with more threatened fragments, with only 17.5% of original forest coverage in the State (São Paulo, 2016a). Even so, many studies carried out in small altered forest fragments (Ivanauskas et al., 1999; Cardoso-Leite and Rodrigues, 2008; Corrêa et al., 2014; Coelho et al., 2016) found local richness in species and its importance for regional species conservation, when considered together with other fragments (Brancalion et al., 2015; Vidal et al., 2016).

The city of Piracicaba, a typical, highly agricultural landscape in central São Paulo State, suffered even more intense devastation, with only 9.2% remaining of its original vegetation, composed of small fragments (São Paulo, 2016a) with different phytogeographic units such as Seasonal Semideciduous Forest – SSF, Swamp Forest, Seasonal Deciduous Forest and several types of Savanna (Rodrigues, 1999).

Given the relevance of small forest fragments for São Paulo State SSF preservation, we have chosen to expand the knowledge about the Ibicatu Ecological Station floristic composition, a small protected area near Piracicaba. The main goal of our research is to discuss the importance of this small fragment of legally protected forest for local and regional biodiversity conservation.

Thereby, we present an update from previously published checklists of vascular flora (Custódio-Filho et al., 1994; Costa and Mantovani, 1995), which refers only tree and shrub vegetation Our update includes sampling of side ferns, herbs, epiphytes and climber plants, and unpublished tree and shrub species that are present in the Ibicatu Ecological Station. In addition, we verified the endangered species status and identified invasive species. We hope that this checklist will contribute to increase the knowledge about the vascular flora of this small fragment and help establish protection and management policies.

2 MATERIALS AND METHODS

2.1 Study site

The Ibicatu Ecological Station is a protected area with 76.40 ha, owned by the Forest Institute of São Paulo, but under management of the Forestry Foundation (São Paulo, 2017). It is in the rural area of Piracicaba, state of São Paulo, between coordinates 22° 46' 49" S and 47° 49' 09" W, and elevation between 540-580 meters (Piracicaba, 2017). It is located in a Peripheral Depression in the state of São Paulo, classified as a Seasonal Semideciduous Forest (IBGE, 2012). According to Köeppen (1948), the climate is classified as Cwa (subtropical hot summer climate), with highest average temperatures of 23.9°C (January) and lowest of 16.1°C (June) (Custódio-Filho et al., 1994).

2.2 Data collection

The floristic survey was based on the walking method (Filgueiras et al., 1994), which a quick survey of unpublished species (Walter and Guarino, 2006), to complement the previous protected area checklist to make information easily available to decision-makers (Walter and Guarino, 2006). Botanical material was collected in reproductive and vegetative state by a flora research group, in a three-day expedition carried out in July 2015. We observed other floristic-survey information in the literature mentioned (Leão, 1994; Custódio-Filho et al., 1994; Costa and Mantovani, 1995), which used the plot method to collect quantitative data in this protected area. Our study also included digital records of exsiccates collected in the protected area, available at the SpeciesLink Databases (2016). All collected material was herborized according to IBGE (2012) protocols and incorporated to the ESA Herbarium (acronyms followed Thiers, continuously updated), Piracicaba, and duplicates were sent to UEC and SPSF.

2.3 Data analysis

The plants were identified using specialized literature, such as that from the São Paulo State Phanerogamic Flora (Wanderley et al., 2002, 2003, 2005), by comparison with herbaria collections (ESA, SPF and UEC) and Flora and Fungi Virtual Herbarium (INCT, 2016) and consulting experts. The classification of plant families followed APG IV (2016) for angiosperms and Smith et al. (2006) for ferns. The names were confirmed according to the Missouri Botanical Garden (Tropicos, 2016) and the Brazilian Flora Species List (Flora of Brazil 2020). Conservation status of taxa collected followed the Brazilian Flora Red Book (Martinelli and Moraes, 2013), the list of endangered species of the state of São Paulo (São Paulo, 2016b) and the International Union for Conservation of Nature red list of threatened species (IUCN, 2015). Life form descriptions were defined according to the Brazilian Flora Species List (Flora of Brazil, 2020); exotic plants were considered according to Moro et al. (2012) and Durigan et al. (2013); invasive exotic species were considered according to Richardson et al. (2000).

3 RESULTS

This survey sampled 187 vascular species from 132 genera and 69 vascular families in the Ibicatu Ecological Station. From this primary data, we compiled secondary data about the protected area (Custódio-Filho et al., 1994; Costa and Mantovani, 1995; speciesLink, 2016), in a total of 289 species in all life forms (Table 1). Among taxa sampled in the primary data, 23 were fern species and 164 angiosperms species, with nine morpho species. Identification up to the species level found eight life forms (Table 1); however, some species may have two or more life forms (Flora of Brazil, 2020). Non-woody life forms represented 62% of the survey, especially herbs and epiphytes (Figure 1). Shrubs represented 11% and trees 27% of the survey.

Aspleniaceae and Pteridaceae were most represented fern families, both with seven species. Angiosperm families represent 88% of survey species, but few families represent many species, with Fabaceae (15), Euphorbiaceae (nine), Malvaceae and Meliaceae (eight), Asteraceae and Solanaceae (seven), Rubiaceae and Rutaceae (six), Sapindaceae and Piperaceae (five).

Few genera presented more than one species among all life forms. For non-woody life forms, the climber genera *Dalechampia* and *Serjania*, herb genera *Adiantum, Doryopteris* and *Wissadula* presented two species. *Asplenium* and *Tillandsia* were the most diverse epiphyte genera, with five and three species, respectively. Among tree and shrub life forms, *Trichilia* (five) and *Psychotria* (three) were the genera with more species.

Table 1. Ibicatu Ecological Station vascular plant species list. **H -** Habits: Climber (C); Epiphyte herb (EH); Herb (H); Palm (P); Shrub (S); Subshrub (SS); Tree (T); Treelet (TL). **RLP -** Red lists presence: São Paulo State list (SP - São Paulo, 2016b), Brazilian list (BR - Martinelli and Moraes, 2013) and Global List (GL - International Union for Conservation of Nature red list of threatened species, 2016). Categories of endangered species: Endangered (EN), Vulnerable (VU), Least Concerned (LC). **IS** – Information source: Primary data (P); Secondary data (S): * Based on survey results by Custódio-Filho and contributors (1994); ** Based on survey results by Costa & Mantovani (1995). **VOUCHER**: voucher herbarium specimen (NY, SP or SPSF Herbarium or collector number in ESA Herbarium with duplicates in UEC and SPSF); (1) Brazilian alien species; (2) Brazilian aggressive invader plants.

Tabela 1. Lista de espécies vasculares da Estação Ecológica de Ibicatu. **H -** Hábito: Trepadeira (C); Epífita Herbácea (EH); Herbácea (H); Palmeira (P); Arbusto (S); Subarbusto (SS); Árvore (T); Arvoreta (TL). **RLP –** Presença das Espécies em Listas Oficiais de Espécies Ameaçadas: Estado de São Paulo (SP - São Paulo, 2016b), Brasil (BR - Martinelli and Moraes, 2013) e Lista Oficial Internacional (GL - International Union for Conservation of Nature red list of threatened species, 2016). Categorias de Ameaça: Em Perigo (EN); Vulnerável (VU); Menor preocupação (LC). **IS** – Fonte de informação: Dados primários (P); Dados secundários (S): * Baseado nos resultados do levantamento de Custódio-Filho e colaboradores (1994); ** Baseado nos resultados do levantamento de Costa & Mantovani (1995). **VOUCHER**: espécimes depositadas em herbários (Herbários de NY, SP, SPSF, ou número do coletor no herbário ESA, com duplicatas na UEC e SPSF); (1) espécies exóticas; (2) espécies invasoras e agressivas.

FAMILY/SPECIES	H	RLS	IS	VOUCHER
FERNS				
Anemiaceae				
Anemia phyllitidis (L.) Sw.	H	-	P	Toledo, C.A.P. et al. 104
Aspleniaceae				
Asplenium auritum Sw.	EH	-	P	Barroso, R.M. et al. 234
Asplenium bradei Rosenst.	EH	-	P	Toledo, C.A.P. et al. 173
Asplenium claussenii Hieron	EH	-	P	Barroso, R.M. et al. 230
Asplenium formosum Willd.	EH	LC(GL)	P	Barroso, R.M. et al. 228
Asplenium stuebelianum Hieron	H	-	P	Orlandini, P. et al. 149
Asplenium sp.	EH	-	P	Barroso, R.M. et al. 229
Hymenasplenium laetum (Sw.) L. Regalado & Prada	H	-	P	Scatigna, A.V. et al. 991
Dryopteridaceae				
Ctenitis sp.	H	-	P	Scatigna, A.V. et al. 989
Parapolystichum effusum (Sw.) Ching	H	-	P	Scatigna, A.V. et al. 992
Hymenophyllaceae				
Didymoglossum reptans (Sw.) C.Presl	EH	-	P	Scatigna, A.V. et al. 987
Polypodiaceae				
Microgramma squamulosa (Kaulf.) de la Sota	EH	-	P	Orlandini, P. et al., 101
Pleopeltis minima (Bory) J. Prado & R.Y. Hirai	EH	-	P	Orlandini, P. et al. 112
Pleopeltis pleopeltifolia (Raddi) Alston	EH	-	P	Barroso, R.M. et al. 227
Pteridaceae				
Adiantopsis radiata (L.) Fée	H	-	P	Toledo, C.A.P. et al. 177
Adiantum diogoanum Glaziou ex. Baker	H	-	P	Toledo, C.A.P. et al. 180
Adiantum raddianum C. Presl.	H	-	P	Scatigna, A.V. et al. 986
Doryopteris concolor (Langsd. & Fisch.) Kuhn	H	-	P	Scatigna, A.V. et al. 878
Doryopteris pentagona Pic.Serm.	H	-	P	Toledo, C.A.P. et al. 105
Hemionitis tomentosa (Lam.) Raddi	H	-	P	Toledo, C.A.P. et al. 175
Pteris denticulata Sw.	H	-	P	Scatigna, A.V. et al. 875
Thelypteridaceae				
Ciclosorus dentatus (Forssk.) Ching	H	-	P	Scatinga, A.V. et al. 887
Macrothelypteris torresiana (Gaudich.) Ching	H	-	P	Toledo, C.A.P. et al. 114

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
ANGIOSPERMS				
Acanthaceae				
Aphelandra schottiana (Nees) Profice	H, S	-	P	Scatigna, A.V. et al. 876
Justicia lythroides (Nees) V.A.W.Graham	H	-	P	Scatigna, A.V. et al. 869
Ruellia brevifolia (Pohl) C.Ezcurra	SS	-	P	Scatigna, A.V. et al. 874
Amaranthaceae				
Alternanthera tenella Colla	H	-	P	Scatigna, A.V. et al. 883
Anacardiaceae				
Astronium graveolens Jacq.	T	-	P	Orlandini, P. et al. 135
Lithrea molleoides (Vell.) Engl.	T	-	P	Orlandini, P. et al. 246
Tapirira guianensis Aubl.	T	-	S(*)	
Annonaceae				
Annona dolabripetala Raddi	T	-	P	Orlandini, P. et al. 131
Annona parviflora (A.St.-Hil.) H.Rainer	T	-	S(*)	
Guatteria australis A.St.-Hil.	TL, T	-	S(**)	
Apocynaceae				
Aspidosperma cylindrocarpon Müll.Arg.	T	-	S(**)	
Aspidosperma olivaceum Müll.Arg.	T	-	S(**)	
Aspidosperma polyneuron Müll.Arg.	T	EN(GL)	P	Barroso, R.M. et al. 92
Aspidosperma ramiflorum Müll.Arg.	T	-	P	Barroso, R.M. et al. 95
Tabernaemontana catharinensis A.DC.	T	-	P	Orlandini, P. et al. 233
Araliaceae				
Dendropanax cuneatus (DC.) Dcne. & Planch.	T	-	S(*)	
Arecaceae				
Acrocomia aculeata (Jacq.) Lodd. ex Mart.	P	-	P	Scatigna, A.V. et al. 988
Euterpe edulis Mart.	P	VU(SP), EN(BR)	P	Orlandini, P. et al. 251
Syagrus romanzoffiana (Cham.) Glassman	P	-	S(*)	
Asteraceae				
Chromolaena maximilianii (Schrad. ex DC.) R.M.King & H.Rob.	H	-	P	Scatigna, A.V. et al. 882
Chromolaena sp.	H	-	P	Scatigna, A.V. et al. 971
Mikania glomerata Spreng.	C	-	P	Barroso, R.M. et al. 223
Moquiniastrum polymorphum (Less.) G. Sancho	T	-	P	Orlandini, P. et al. 145
Piptocarpha axillaris (Less.) Baker	T	-	S(*)	
Sphagneticola trilobata (L.) Pruski	H	-	P	Scatigna, A.V. et al. 881
Synedrela nodiflora (L.) Gaertn.	H	-	P	Scatigna, A.V. et al. 868
Vernonanthura brasiliana (L.) H.Rob.	H	-	P	Toledo, C.A.P. et al. 113
Vernonanthura puberula (Less.) H.Rob.	T	-	S(*)	
Balanoforaceae				
Scybalium fungiforme Schott & Endl.	H	-	P	Toledo, C.A.P. et al. 184
Bignoniaceae				
Handroanthus albus (Cham.) Mattos	T	-	S(**)	
Handroanthus ochraceus (Cham.) Mattos	T	-	P	Barroso, R.M. et al. 113
Jacaranda micrantha Cham.	T	-	S(*)	
Jacaranda puberula Cham.	T	-	S(**)	

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
Tecoma stans (L.) Juss. ex Kunth [1]	T	-	P	Barroso, R.M. et al. 112
Indeterminate	C	-	P	Orlandini, P. et al. 102
Boraginaceae				
Cordia americana (L.) Gottschling & J.S.Mill.	T	-	P	Barroso, R.M. et al. 84
Cordia ecalyculata Vell.	T	-	P	Orlandini, P. et al. 231
Cordia sellowiana Cham.	T	-	S(*)	
Cordia trichotoma (Vell.) Arráb. ex Steud.	T	-	S(*)	
Heliotropium transalpinum Vell.	S	-	P	Toledo, C.A.P. et al. 94
Bromeliaceae				
Acanthostachys strobilacea (Schult. & Schult.f.) Klotzsch.	EH	-	S	NY 376272
Aechmea bromeliifolia (Rudge) Baker	EH	-	P	Scatigna, A.V. et al. 898
Tillandsia recurvata (L.) L.	EH	-	P	Orlandini, P. et al. 100
Tillandsia tricholepis Baker	EH	-	P	Orlandini, P. et al. 95
Tillandsia usneoides (L.) L.	EH	-	P	Orlandini, P. et al. 99
Cactaceae				
Epiphyllum phyllanthus (L.) Haw.	EH	LC(GL)	P	Orlandini, P. et al. 98
Rhipsalis cereuscula Haw.	EH	LC(GL)	P	Barroso, R.M. et al. 224
Cannabaceae				
Celtis iguanaea (Jacq.) Sarg.	S	-	P	Barroso, R.M. et al. 125
Cardiopteridaceae				
Citronella paniculata (Mart.) R.A.Howard	T	-	S(**)	
Caricaceae				
Jacaratia spinosa (Aubl.) A.DC.	T	-	P	Barroso, R.M. et al. 101
Vasconcellea quercifolia A.St.-Hil.	TL,T	-	S(**)	
Celastraceae				
Maytenus aquifolia Mart.	T	-	P	Barroso, R.M. et al. 90
Maytenus cestrifolia Reissek	TL, T	-	S(**)	
Maytenus gonoclada Mart.	T	-	S(*)	
Maytenus ilicifolia Mart. ex Reissek	T	VU(SP)	P	Orlandini, P. et al. 143
Commelinaceae				
Commelina obliqua Vahl	H	-	P	Scatigna, A.V. et al. 897
Tradescantia zanonia (L.) Sw.	H	-	P	Toledo, C.A.P. et al. 178
Tradescantia zebrina Heynh. ex Bosse [2]	H	-	P	Scatigna, A.V. et al. 870
Convolvulaceae				
Ipomoea ramosissima (Poir.) Choisy	H	-	P	Toledo, C.A.P. et al. 108
Cyperaceae				
Cyperus iria L.	H	LC(GL)	P	Scatigna, A.V. et al. 880
Scleria gaertneri Raddi	H	-	P	Scatigna, A.V. et al. 890
Dioscoreaceae				
Dioscorea multiflora Mart. ex Griseb.	C	-	P	Barroso, R.M. et al. 232
Euphorbiaceae				
Actinostemon concepcionis (Chodat & Hassl.) Hochr.	T	-	S(*)	
Actinostemon concolor (Spreng.) Müll.Arg.	S	-	P	Toledo, C.A.P. et al. 92
Actinostemon klotzschii (Didr.) Pax	S	-	P	Scatigna, A.V. et al. 968
Alchornea glandulosa Poepp. & Endl.	T	-	S(*)	

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
Alchornea triplinervia (Spreng.) Müll.Arg.	T	-	S(*)	
Croton floribundus Spreng.	T	-	P	Orlandini, P. et al. 137
Croton urucurana Baill.	T	-	S	SP 272492
Dalechampia pentaphylla Lam.	C	-	P	Orlandini, P. et al. 104
Dalechampia triphylla Lam.	C	-	P	Orlandini, P. et al. 105
Euphorbia sciadophila Boiss.	H	-	P	Toledo, C.A.P. et al. 103
Sebastiania serrata (Baill. ex Müll.Arg.) Müll.Arg.	T	-	P	Orlandini, P. et al. 126
Gymnanthes klotzschiana Müll.Arg.	T	-	S(*)	
Pachystroma longifolium (Nees) I.M.Johnst.	T	-	P	Barroso, R.M. et al. 103
Indeterminate	S	-	P	Scatigna, A.V. et al. 984
Fabaceae				
Albizia edwallii (Hoehne) Barneby & J.W.Grimes	T	-	S(*/**)	
Anadenanthera colubrina (Vell.) Brenan	T	-	S(**)	
Bauhinia forficata Link	T	LC(GL)	P	Orlandini, P. et al. 242
Calliandra foliolosa Benth.	T	-	P	Orlandini, P. et al. 116
Calliandra tweedii Benth.	S, T	-	S(**)	
Cassia ferruginea (Schrad.) Schrad. ex DC.	T	-	S(*)	
Centrolobium tomentosum Guillem. ex Benth.	T	-	P	Orlandini, P. et al. 142
Chamaecrista rotundifolia (Pers.) Greene	H	-	P	Toledo, C.A.P. et al. 110
Dahlstedtia muehlbergiana (Hassl.) M.J.Silva & A.M.G. Azevedo	T	-	S(*)	
Dalbergia frutescens (Vell.) Britton	S	-	S(**)	
Enterolobium contortisiliquum (Vell.) Morong	T	-	S(*)	
Holocalyx balansae Micheli	T	-	P	Barroso, R.M. et al. 100
Inga edulis Mart.	T	-	S(**)	
Inga marginata Willd.	T, TL	LC(GL)	P	Scatigna, A.V. et al. 977
Inga striata Benth.	T	LC(GL)	S(*)	
Lonchocarpus cultratus (Vell.) A.M.G.Azevedo & H.C.Lima	T	-	P	Orlandini, P. et al. 127
Machaerium brasiliense Vogel	T	LC(GL)	S(*)	
Machaerium nyctitans (Vell.) Benth.	T	-	P	Orlandini, P. et al. 151
Machaerium scleroxylon Tul.	T	LC(GL)	P	Barroso, R.M. et al. 88
Machaerium stipitatum Vogel	T	-	S(*)	
Machaerium uncinatum (Vell.) Benth.	S	-	S(**)	
Machaerium villosum Vogel	T	VU (GL)	S(*)	
Myroxylon balsamum (L.) Harms	T	-	S(*)	
Myroxylon peruiferum L.f.	T	-	P	Barroso, R.M. et al. 107
Peltophorum dubium (Spreng.) Taub.	T	-	P	Barroso, R.M. et al. 99
Piptadenia gonoacantha (Mart.) J.F.Macbr.	T	-	S(*)	
Platypodium elegans Vogel	T	LC(GL)	S(*)	
Pterocarpus rohrii Vahl	T	-	S(**)	
Senegalia polyphylla (DC.) Britton & Rose	T	-	P	Orlandini, P. et al. 234
Senna hirsuta (L.) H.S.Irwin & Barneby	S	-	P	Toledo, C.A.P. et al. 87
Senna pendula (Humb.& Bonpl. ex Willd.) H.S.Irwin & Barneby	S	LC(GL)	P	Barroso, R.M. et al. 124
Zollernia ilicifolia (Brongn.) Vogel	T	-	P	Barroso, R.M. et al. 118

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
Lamiaceae				
Aegiphila integrifolia (Jacq.) Moldenke	T	-	P	Orlandini, P. et al. 140
Marsypianthes chamaedrys (Vahl) Kuntze	H	-	P	Toledo, C.A.P. et al. 115
Vitex megapotamica (Spreng.) Moldenke	T	-	S(*)	
Indeterminate	H	-	P	Toledo, C.A.P. et al. 107
Lauraceae				
Endlicheria paniculata (Spreng.) J.F.Macbr.	T	-	S(*)	
Nectandra lanceolata Nees	T	-	S(*)	
Nectandra megapotamica (Spreng.) Mez	T	-	P	Orlandini, P. et al. 250
Nectandra oppositifolia Nees	T	-	S(*)	
Ocotea corymbosa (Meisn.) Mez	T	-	S(**)	
Ocotea elegans Mez	T	-	S(*)	
Ocotea lanata (Nees & Mart.) Mez	T	-	S(**)	
Ocotea velloziana (Meisn.) Mez	T	-	S(**)	
Ocotea velutina (Nees) Rohwer	T	-	S(*)	
Lecythidaceae				
Cariniana estrellensis (Raddi) Kuntze	T	-	P	Orlandini, P. et al. 124
Cariniana legalis (Mart.) Kuntze	T	VU (GL)	P	Barroso, R.M. et al. 108
Malpighiaceae				
Janusia guaranitica (A.St.-Hil.) A.Juss.	C	-	P	Scatigna, A.V. et al. 904
Indeterminate	C	-	P	Orlandini, P. et al. 109
Malvaceae				
Bastardiopsis densiflora (Hook. & Arn.) Hassl.	T	-	P	Barroso, R.M. et al. 86
Callianthe fluviatilis (Vell.) Donnel	S	-	S(**)	
Ceiba speciosa (A.St.-Hil.) Ravenna	T	-	P	Barroso, R.M. et al. 102
Eriotheca candolleana (K.Schum.) A.Robyns	T	-	S(*)	
Guazuma ulmifolia Lam.	T	-	P	Orlandini, P. et al. 241
Heliocarpus popayanensis Kunth	T	-	S(*)	
Luehea divaricata Mart. & Zucc.	T	-	P	Orlandini, P. et al. 240
Sida planicaulis Cav.	H, S	-	P	Scatigna, A.V. et al. 879
Sidastrum micranthum (A.St.-Hil.) Fryxell	H	-	P	Toledo, C.A.P. et al. 102
Wissadula hernandioides (L.Hér.) Garcke	H	-	P	Scatigna, A.V. et al. 889
Wissadula wissadifolia (Griseb.) Krapov.	H	-	P	Toledo, C.A.P. et al. 112
Melastomataceae				
Clidemia hirta (L.) D.Don	S	-	P	Scatigna, A.V. et al. 998
Miconia discolor DC.	S	-	P	Barroso, R.M. et al. 122
Meliaceae				
Cabralea canjerana (Vell.) Mart.	T	-	S(*)	
Cedrela fissilis Vell.	T	EN (GL)	P	Orlandini, P. et al. 244
Guarea guidonia (L.) Sleumer	T	-	P	Orlandini, P. et al. 247
Guarea macrophylla Vahl	T	-	P	Orlandini, P. et al. 133
Trichilia casaretti C.DC.	T	VU (GL)	S(**)	
Trichilia catigua A.Juss.	T	-	P	Barroso, R.M. et al. 93
Trichilia clausseni C.DC.	T	-	P	Barroso, R.M. et al. 94
Trichilia elegans A.Juss.	T	-	P	Barroso, R.M. et al. 110
Trichilia pallida Sw.	T	-	P	Orlandini, P. et al. 153
Trichilia silvatica C.DC.	T	VU (GL)	P	Orlandini, P. et al. 122

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
Menispermaceae				
Cissampelos pareira L.	C	VU (SP)	P	Scatigna, A.V. et al. 900
Moraceae				
Ficus gomelleira Kunth	T	-	S(*)	
Ficus guaranitica Chodat	T	-	P	Orlandini, P. et al. 148
Ficus luschnathiana (Miq.) Miq.	T	-	S(*)	
Sorocea bonplandii (Baill.) W.C.Burger et al.	TL, T	-	S(*/**)	
Myrtaceae				
Calyptranthes gradiflora O.Berg.	T	-	S(**)	
Campomanesia guaviroba (DC.) Kiaersk.	T	-	S(*)	
Campomanesia guazumifolia (Camb.) O.Berg.	T	-	S(**)	
Campomanesia neriiflora (O.Berg) Nied.	T	VU (GL)	S	SP 272496
Campomanesia xanthocarpa (Mart.) O.Berg	T	-	P	Orlandini, P. et al. 227
Eugenia florida DC.	T	-	S(*)	
Eugenia sphenophylla O.Berg	T	-	S(**)	
Eugenia sulcata Spring ex Mart.	T	-	S(**)	
Myrciaria floribunda (H.West ex Willd.) O.Berg	T	-	S(*)	
Plinia rivularis (Cambess.) Rotman	T	-	S(*)	
Siphoneugena densiflora O.Berg	T	-	S(**)	
Indeterminate	T	-	P	Orlandini, P. et al. 141
Indeterminate	T	-	P	Orlandini, P. et al. 152
Indeterminate	T	-	P	Orlandini, P. et al. 226
Nyctaginaceae				
Guapira opposita (Vell.) Reitz	T	-	S(*)	
Neea parviflora Poepp. & Endl.	TL,T	-	S(**)	
Pisonia aculeata L.	S, C	-	P	Scatigna, A.V. et al. 907
Olacaceae				
Heisteria silviani Schwacke	T	-	S(*)	
Onagraceae				
Ludwigia octovalvis (Benth.) P.H.Raven	H	LC(GL)	P	Scatigna, A.V. et al. 892
Orchidaceae				
Cyclopogon variegatus Barb.Rodr.	H	-	P	Toledo, C.A.P. et al. 106
Oeceoclades maculata (Lindl.) Lindl.	H	LC(GL)	P	Scatigna, A.V. et al. 873
Zeuxine strateumatica (L.) Schltr.[(1)]	H	LC(GL)	P	Scatigna, A.V. et al. 886
Oxalidaceae				
Oxalis rhombeo-ovata A.St.-Hil.	SS, S, H	-	P	Scatigna, A.V. et al. 983
Phyllanthaceae				
Savia dictyocarpa Müll.Arg.	S, T	-	P	Orlandini, P. et al. 117
Phytolaccaceae				
Gallesia integrifolia (Spreng.) Harms	T	-	P	Barroso, R.M. et al. 96
Seguiera aculeata Jacq.	S	-	S(**)	
Seguieria langsdorffii Moq.	T	-	P	Barroso, R.M. et al. 109
Piperaceae				
Peperomia delicatula Henschen	EH	-	P	Scatigna, A.V. et al. 903
Peperomia hydrocotyloides Miq.	H	EX (SP)	P	Scatigna, A.V. et al. 990
Peperomia rotundifolia (L.) Kunth	EH	-	P	Barroso, R.M. et al. 231

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
Piper amalago L.	S	-	P	Barroso, R.M. et al. 119
Piper lhotzkyanum Kunth	H, S	-	P	Scatigna, A.V. et al. 969
Plantaginaceae				
Scoparia dulcis L.	H	-	P	Scatigna, A.V. et al. 891
Poaceae				
Acroceras zizanoides (Kunth) Dandy	H	-	P	Scatigna, A.V. et al. 888
Plismenus hirtellus (L.) P.Beauv.	H	-	P	Scatigna, A.V. et al. 872
Indeterminate	H	-	P	Scatigna, A.V. et al. 871
Indeterminate	H	-	P	Toledo, C.A.P. et al. 111
Polygonaceae				
Polygonum persicaria L.	H	LC(GL)	P	Scatigna, A.V. et al. 895
Ruprechtia laxiflora Meisn.	T	-	P	Barroso, R.M. et al. 91
Primulaceae				
Geissanthus ambiguous (Mart.) G.Agostini	T	-	P	Orlandini, P. et al. 123
Myrsine balansae (Mez) Otegui	T	-	P	Orlandini, P. et al. 120
Myrsine coriacea (Sw.) R.Br. ex Roem. & Schult.	T	-	S(*)	
Myrsine gardneriana A.DC.	T	-	S(*)	
Myrsine umbellata Mart.	T	-	S(*)	
Proteaceae				
Roupala montana Aubl.	S, T	-	S(*/**)	
Rhamnaceae				
Colubrina glandulosa Perkins	T	-	P	Orlandini, P. et al. 136
Gouania virgata Reissek	C	-	P	Orlandini, P. et al. 103
Rhamnidium elaeocarpum Reissek	T	-	P	Orlandini, P. et al. 238
Rosaceae				
Prunus myrtifolia (L.) Urb.	T	-	S(*)	
Rubiaceae				
Amaioua guianensis Aubl.	S, T	-	S(**)	
Chomelia ribesioides Benth. ex A.Gray	S, T	-	S(**)	
Coffea arabica L. [(1)]	S	-	S(**)	
Coutarea hexandra (Jacq.) K.Schum	T	-	S(*)	
Ixora venulosa Benth.	T	-	S(*)	
Margaritopsis cephalantha (Müll.Arg.) C.M.Taylor	S	-	P	Scatigna, A.V. et al. 994
Psychotria carthagenensis Jacq.	S	-	P	Scatigna, A.V. et al. 993
Psychotria leiocarpa Cham. & Schltdl.	S	-	S(**)	
Psychotria myriantha Müll.Arg.	T	-	P	Orlandini, P. et al. 222
Psychotria sp.	S	-	P	Scatigna, A.V. et al. 985
Randia armata (Sw.) DC.	S, T	-	P	Toledo, C.A.P. et al. 89
Rudgea jasminoides (Cham.) Müll.Arg.	S, T	-	P	Scatigna, A.V. et al. 972
Rutaceae				
Balfourodendron riedelianum (Engl.) Engl.	T	EN (GL)	P	Barroso, R.M. et al. 97
Conchocarpus pentandrus (A.St.-Hil.) Kallunki & Pirani	S, T	-	P	Barroso, R.M. et al. 111
Esenbeckia febrifuga (A.St.-Hil.) A.Juss.ex Mart.	T	-	S(*)	
Esenbeckia grandiflora Mart.	T	-	S(*)	
Esenbeckia leiocarpa Engl.	T	VU (GL)	P	Barroso, R.M. et al. 106

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
Metrodorea nigra A.St.-Hil.	S, T	-	P	Scatigna, A.V. etal. 1001
Pilocarpus pauciflorus A.St.-Hil.	T	-	P	Orlandini, P. et al. 237
Pilocarpus pennatifolius Lem.	T	-	S(**)	
Zanthoxylum acuminatum (Sw.) Sw.	T	-	S(**)	
Zanthoxylum fagara (L.) Sarg.	S, T	-	P	Barroso, R.M. et al. 116
Zanthoxylum rhoifolium Lam.	T	-	S(*)	
Salicaceae				
Casearia decandra Jacq.	T	-	S(*)	
Casearia gossypiosperma Briq.	T	-	P	Barroso, R.M. et al. 87
Casearia sylvestris Sw.	T	-	P	Orlandini, P. et al. 239
Prockia crucis P.Browne ex L.	T	-	S(*)	
Xylosma pseudosalzmanii Sleumer	T	-	P	Barroso, R.M. et al. 105
Sapindaceae				
Cupania vernalis Cambess.	T	-	P	Orlandini, P. et al. 134
Diatenopteryx sorbifolia Radlk.	T	-	P	Scatigna, A.V. et al. 973
Dodonaea viscosa Jacq.	T	-	P	Scatigna, A.V. etal. 1000
Matayba elaeagnoides Radlk.	T	-	S(*)	
Matayba guianensis Aubl.	TL, T	-	S(**)	
Serjania caracasana (Jacq.) Willd.	C	-	P	Scatigna, A.V. et al. 906
Serjania fuscifolia Radlk.	C	-	P	Scatigna, A.V. et al. 901
Sapotaceae				
Chrysophyllum gonocarpum (Mart. & Eichler ex Miq.) Engl.	T	-	P	Orlandini, P. et al. 138
Chrysophyllum marginatum (Hook. & Arn.) Radlk.	TL, T	-	S(**)	
Scrophulariaceae				
Buddleja stachyoides Cham. & Schltdl.	SS, S	-	P	Scatigna, A.V. et al. 884
Simaroubaceae				
Picramnia parvifolia Engl.	TL, T	-	S(**)	
Siparunaceae				
Siparuna brasiliensis (Spreng.) A.DC.	TL, T	-	S(**)	
Smilacaceae				
Smilax campestris Griseb.	C	-	P	Barroso, R.M. et al. 226
Solanaceae				
Acnistus arborescens (L.) Schltdl.	T	-	S(*)	
Capsicum recurvatum Witasek	S	-	P	Scatigna, A.V. et al. 996
Cestrum mariquitense Kunth	S	-	P	Toledo, C.A.P. et al. 100
Cestrum strigilatum Ruiz & Pav.	S	-	P	Scatigna, A.V. et al. 894
Solanum concinnum Schott ex Sendtn.	S	-	P	Barroso, R.M. et al. 123
Solanum gnaphalocarpon Vell.	S	-	P	Scatigna, A.V. et al. 981
Solanum hirtellum (Spreng.) Hassl.	C	-	P	Scatigna, A.V. et al. 902
Solanum megalochiton Mart.	S	-	S(**)	
Solanum swartzianum Roem. & Schult.	S	-	P	Barroso, R.M. et al. 115
Solanum variable Mart.	T, S	-	S	NY 781315
Urticaceae				
Boehmeria caudata Sw.	S, T	-	P	Orlandini, P. et al. 139
Cecropia glaziovii Snethl.	T	-	S(**)	

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FAMILY/SPECIES	H	RLS	IS	VOUCHER
Cecropia pachystachya Trécul	T	-	S(*)	
Urera baccifera (L.) Gaudich. ex Wedd.	S	-	P	Toledo, C.A.P. et al. 91
Verbenaceae				
Aloysia virgata (Ruiz & Pav.) Juss.	T	-	S(*)	
Citharexylum myrianthum Cham.	T	-	P	Orlandini, P. et al. 150
Lantana fucata Lindl.	H	-	P	Scatigna, A.V. et al. 896
Lantana trifolia L.	SS, S	-	P	Scatigna, A.V. et al. 885
Petrea volubilis L.	C	-	P	Scatigna, A.V. et al. 899
Violaceae				
Pombalia atropurpurea (A.St.-Hil.) Paula-Souza	S	-	P	Barroso, R.M. et al. 121
Pombalia bigibbosa (A.St.-Hil.) Paula-Souza	T	-	P	Orlandini, P. et al. 125
Vochysiaceae				
Qualea cinnamomea Pohl	T	-	P	SPSF 04541
Qualea multiflora Mart.	T	-	S(*)	

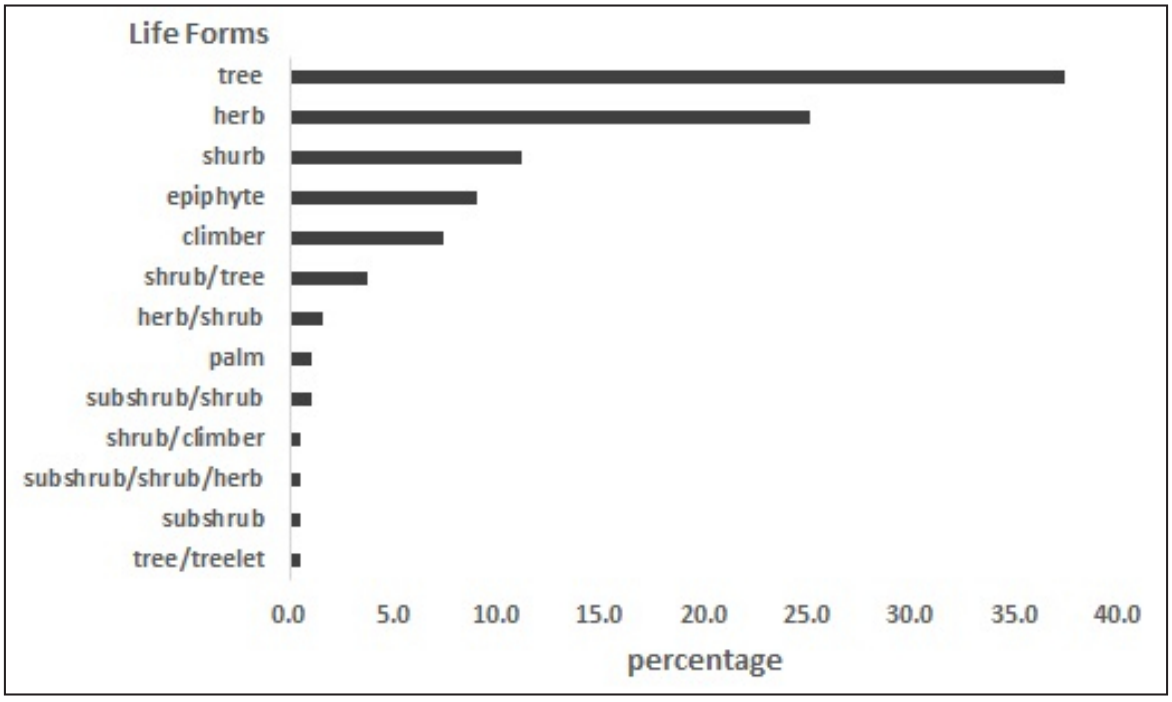

Figure 1. Percentage of species richness for all life forms found in the Ibicatu Ecological Station survey.

Figura 1. Percentual da riqueza de espécies para todas as formas de vida presentes no levantamento florístico da Estação Ecológica de Ibicatu.

We observed that *Asplenium formosum* was the only fern species in the floristic survey mentioned by the IUCN red list of threatened species (2016), last concern categorized. Regarding angiosperms, we verified that 13 species were classified as endangered or vulnerable in the IUCN red list (Table 1). *Cariniana legalis* and *Cedrela fissilis* are mentioned in the list of endangered species of the state of São Paulo (São Paulo, 2016b), the IUCN red list of threatened species (2016) and the Brazilian Flora Red Book (Martinelli and Moraes, 2013), respectively, as endangered and vulnerable species. *Euterpe edulis* was classified as endangered in

the Brazilian Flora Red Book (Martinelli and Moraes, 2013) and vulnerable in the list of endangered species of the state of São Paulo (São Paulo, 2016b). According to the list of endangered species of the state of São Paulo, *Peperomia hydrocotyloides* was considered extinct in nature and *Maytenus ilicifolia* was classified as a vulnerable species.

4 DISCUSSION

Even though it is a small fragment, the Ibicatu Ecological Station still reports a richness of angiosperm families with SSF traits, as sampled in the previous floristic surveys, which identified 110 (Custódio-Filho et al., 1994) and 103 (Costa and Mantovani, 1995) woody species. From the method used in this survey, which addressed all vascular life forms, 102 species were added, evidencing the importance of preserving this protected area. The families that were richer in species in this survey also mentioned in others SSF floristic woody surveys from the state of São Paulo (Leitão-Filho, 1987; Cardoso-Leite and Rodrigues, 2008; Corrêa et al., 2014; Coelho et al., 2016), which confirmed the forest characteristic formation in the protected area.

About the fern group, the most common families found in this survey were reported in others fern checklists in Brazilian SSF (Melo and Salino, 2002; Forzza et al., 2014; Mazziero and Nonato, 2015), which are among the ten richest fern families in Brazilian flora (Prado et al., 2015). Observing the surveys by these authors, there are few species present in both checklists: *Asplenium bradei, Pleopeltis pleopeltifolia,* and *Doryopteris concolor* (Mazziero and Nonato, 2015), *Pteris denticulata* (Forzza et al., 2014) and *Macrothelypteris torresiana* (Melo and Salino, 2002). Highlight to *Anemia phyllitidis*, a species from conserved forest patches (Melo and Salino, 2002) and reported in the checklists by Mazziero and Nonato (2015) and Melo and Salino, 2002.

The fern survey in this small fragment represents 3.7% of all species in the state of São Paulo (Prado et al., 2015), which we consider as good, due to its total area and the monoculture matrix where it is inserted. The species by total area of the fragment, in hectares (three species), is similar to what was found in studies carried out in larger fragments, such as Forzza et al. (2014) and Mazziero and Nonato (2015), with four and three species per hectare, respectively, sampled in fragments of 200 hectares.

Epiphyte life form represents approximately 10% of all vascular plants in tropical forest (Gentry and Dodson, 1987), maintaining a fundamental ecological relationship with the local fauna. We verified that 55% of all epiphytes species found in this survey were also present in other recent checklists (Table 2), carried out in Brazilian SSF fragments in different conservation stages. *Tillandsia recurvata* demonstrated to be the most generalist species, with occurrence in all surveys, followed by *Epiphyllum phyllanthus*. Highlight to *Peperomia rotundifolia,* a very delicate epiphyte species with shaded life, which had been sampled by Marcusso et al. (2016) in SSP of the Porto Ferreira State Park. The presence of this species, considered to be extinct in the state of São Paulo (São Paulo, 2016b), highlights the role of small forest fragments in the conservation of biodiversity (Vidal et al., 2016).

An expressive portion of the species found in this survey refers to herbal life forms (47 species), with numbers smaller only than tree life forms. However, few publications about species richness of herb life forms were conducted in semidecidual forests. Observing the survey by Stranghetti and Ranga (1998), we verified that species number was almost four times smaller (10 species). Even so, *Adiantum, Commelina* and *Cyperus* genera are present in the two surveys. *Anemia phyllitidis* is a species common among researches, a common SSF species. Among the herbs, we collected *Tradescantia zebrina,* a dominant invader species (Zenni and Ziller, 2011) and *Zeuxine strateumatica*, another exotic species, more common in humid environments in human-modified landscapes (Neto et al., 2011), though it is a non-dominant ruderal species.

Climber life forms are a very important tropical forest component, contributing with 19% of all species richness in dry and pluvial forests (Gentry and Dodson, 1987). We identified species typical to SSF, sampled in recent checklists in similar forest formations (Udulutsch et al., 2004, 2010; Tibiriçá et al., 2006; Santos et al., 2009). Our sampling was small, considering SSF in the state of São Paulo (Udulutsch et al., 2004, 2010), but this can be attributed to the method used (walking method), and the greater canopy shading and inhibition of the life form growth (Morellato and Leitão-Filho, 1996), because most samples were inside the forest fragment. Future surveys specifically about climbers can add to this life form's species richness.

Table 2. List of vascular epiphytes also present in other studies conducted in Seasonal Semideciduous Forests. **BW**: Baú Wood; **BBGR**: Biological Reserve of Grama Reservoir; **ISP**: Ibitipoca State Park; **NFI**: National Forest of Ipanema; **SFHS**: Santa Fé Hidroeletric Sistem; **IMP**: Ingá Municipality Park; **BG**: Botanical Garden of Federal University of Juiz de Fora; **PFSP**: Porto Ferreira Sate Park; **ES**: Espírito Santo; **MG**: Minas Gerais; **PR**: Paraná; **SP**: São Paulo; **ASSF**: Alluvial Seasonal Semideciduous Forest; **CER**: Cerrado; **MSSF**: Montane Seasonal Semideciduous Forest; **GF**: Gallery Forest; **SSF**: Seasonal Semideciduous Forest

Tabela 2. Lista de epífitas vasculares igualmente presentes em outros estudos realizados na floresta estacional semidecidual. **BW**: Bosque do Baú; **BBGR**: Reserva Biológica da Represa do Grama; **ISP**: Parque Estadual de Ibitipoca; **NFI**: Floresta Nacional de Ipanema; **SFHS**: Sistema Hidroelétrico de Santa Fé; **IMP**: Parque Municipal Ingá; **BG**: Jardim Botânico da Universidade Federal de Juiz de Fora; **PFSP**: Parque Estadual de Porto Ferreira; **ES**: Espírito Santo; **MG**: Minas Gerais; **PR**: Paraná; **SP**: São Paulo; **ASSF**: Floresta Estacional Semidecidual Aluvial; **CER**: Cerrado; **MSSF**: Floresta Estacional Semidecidual Montana; **GF**: Floresta de Galeria; **SSF**: Floresta Estacional Semidecidual

SPECIES	STUDY AREA	VEGETATION	AUTHORS
Aechmea bromeliifolia (Rudge) Baker	PFSP (SP)	ASSF	Marcusso et al., 2016
	BW/BRGR/ISP (MG)	CER/MSSF/GF	Neto et al., 2009
Epiphyllum phyllanthus (L.) Haw	NFI (SP)	SSF	Bataghin et al., 2010
	SFHS (ES)	SSF	Couto et al., 2016
	PFSP (SP)	ASSF	Marcusso et al., 2016
	BW/BRGR/ISP (MG)	CER/MSSF/GF	Neto et al., 2009
Microgramma squamulosa (Kaulf.) de la Sota	IMP (PR)	SSF	Dettke et al., 2008
	PFSP (SP)	ASSF	Marcusso et al., 2016
	BG (MG)	SSF	Santana et al., 2017
Peperomia rotundifolia (L.) Kunth	PFSP (SP)	ASSF	Marcusso et al., 2016
Pleopeltis minima (Bory) J. Prado & R.Y. Hirai	SFHS (ES)	SSF	Couto et al., 2016
Pleopeltis pleopeltifolia (Raddi) Alston	NFI (SP)	SSF	Bataghin et al., 2010
Rhipsalis cereuscula Haw.	NFI (SP)	SSF	Bataghin et al., 2010
	IMP (PR)	SSF	Dettke et al., 2008
	PFSP (SP)	ASSF	Marcusso et al., 2016
Tillandsia recurvata (L.) L.	SFHS (ES)	SSF	Couto et al., 2016
	IMP (PR)	SSF	Dettke et al., 2008
	PFSP (SP)	ASSF	Marcusso et al., 2016
	BW/BRGR/ISP (MG)	CER/MSSF/GF	Neto et al., 2009
	BG (MG)	SSF	Santana et al., 2017
Tillandsia tricholepis Baker	NFI (SP)	SSF	Bataghin et al., 2010
	IMP (PR)	SSF	Dettke et al., 2008
	PFSP (SP)	ASSF	Marcusso et al., 2016
Tillandsia usneoides (L.) L.	BW/BRGR/ISP (MG)	CER/MSSF/GF	Neto et al., 2009
	PFSP (SP)	ASSF	Marcusso et al., 2016

Among the sampled species, *Dalechampia triphylla, Gouania virgata* and *Serjania caracasana* produce fruits in the dry season (Morellato and Leitão-Filho, 1996). In addition, provision to wildlife throughout the year and serving as potential shelter are other positive aspects of all species sampled in this survey. It is important to emphasize that the *Serjania* genera can become hyperabundant, especially in places with high incidence of sunlight, considered more degraded (Mello, 2015). According to Mello (2015), *Serjania fuscifolia* also has hyperabundant potential in more conserved SSF forest patches, requiring attention to be paid to the entire protected area.

Regarding shrubs, 21 typical species sampled in understory sampled reflect friendly microclimatic condition in this small SSF fragment stratum. *Actinostemon* and *Psychotria* were sampled in others small semideciduous forests (Ivanauskas et al., 1999; Santos and Kinoshita, 2003; Corrêa et al., 2014), and this reinforces the contribution of this small fragment to the maintenance of species richness in this forest stratum. On the other hand, the historical agricultural use of this area by some *Coffea arabica* individuals can still be perceived, with exotic species as part of the current understory.

Our survey for tree and treelet life forms found species of well-conserved forests and very important for forest canopy structures (Durigan et al., 2000; Santos and Kinoshita, 2003), such as *Aspidosperma polyneuron*, *Balfourodendron riedelianum*, *Cariniana legalis* and *Cedrela fissilis*. In addition, we sampled *Euterpe edulis*, *Trichilia casaretti* and *T. silvatica*, species important for wildlife food resource, preserving network interaction (Dias et al., 2016; Beca et al., 2017), as well as ecosystem services (Turner et al., 2007), and maintaining gene flow (Martins et al., 2016). However, *Tecoma stans* is considered an aggressive exotic species (Renó et al., 2007; Silva et al., 2008), requiring attention due to negative impact on native species.

The Ibicatu Ecological Station is a protected area since 1987, inserted in human-modified landscape, and 17.5% of the original forest coverage is composed of small fragments (São Paulo, 2016a). Nevertheless, it presents important and typical species of the SSF forest, some of them threatened, distributed in tree life forms (*Aspidosperma polyneuron, Balfourodendron riedelianum, Cariniana legalis, Cedrela fissilis, Esenbeckia leiocarpa, Maytenus ilicifolia* and *Trichilia silvatica*), palm life forms (*Euterpe edulis*), climber life forms (*Cissampelos pareira)* and herb life forms (*Peperomia hydrocotyloides*). *Maytenus ilicifolia* and *Peperomia hydrocotyloides* are mentioned in the list of endangered species of the state of São Paulo (São Paulo, 2016b) as species presumably extinct in the State, which increases the relevance of this small protected area.

In contrast, we sampled exotic invasive species (Renó et al., 2007; Silva et al., 2008; Zenni and Ziller, 2011), of genera with hyperabundance potential (Mello, 2015), characteristic of an area that suffers anthropic pressures. The balance found between the number of tree and non-tree species still is consistent with the forest dynamics, but it becomes necessary to isolate the area, to protect it from the negative impacts of the surroundings. Otherwise, conservation status can be altered, from increasingly serious and regular negative impacts. Future studies based on this research should be conducted to continuously conserve and increase scientific knowledge about this protected area.

5 CONCLUSIONS

We presented a checklist update of the Ibicatu Ecological Station vascular flora, adding 102 species to the previously published checklist, with woody and non-woody life forms. We consider that this small forest fragment presents rich vascular flora, typical of the SSF of the São Paulo State countryside, some of them threatened species. Our results evidence and corroborate the extreme relevance of this small SSF fragment for local and regional biodiversity.

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